

THE
**SURGICAL INSTRUMENTS
OF THE HINDUS**

WITH

386

**A Comparative Study of the Surgical Instruments of
the Greek, Roman, Arab and the Modern
European Surgeons.**

BY

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TO
THE HON'BLE
SIR ASUTOSH MUKHOPADHYAY, Kt.,

Saraswati, Sastra-vachaspati,

C.S.I., M.A., D.L., D.Sc., F.R.A.S., F.R.S.E., F.A.S.B.,

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in Bengal,**

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Ex-President of the Asiatic Society of Bengal,

AND

Chairman of the Board of Sanskrit Studies,

**In recognition of his love of Science, his pre-eminent services to the cause
of University Education, his administrative ability, and his generous
liberality to scholars**

AS WELL AS

In grateful remembrance of many acts of kindness,

THIS VOLUME IS

DEDICATED

BY

THE AUTHOR

PREFACE.

For researches into the state of medicine among the Ancient Hindus, we have several sources of information to scrutinise. The remarks of Dr. Payne regarding the sources of information of Anglo-Saxon Medicine may apply here with still greater force.¹

First is the evidence of contemporary literature about the craft of physicians and surgeons, since we are sure that there has always been a class of medicine men of one kind or another. Thus we find in the R̥gveda, the use of artificial limb as a substitute for a limb accidentally lost². From the Mahābhārata,

¹ Payne's English Medicine in the Anglo-Saxon Times, P. 7.

² चरित्रं हि वेरिवाच्छेदि पर्णम्
आजा खेलस्य परितक्त्रायाम् ।
सद्यी जङ्घ्रानायसौ विशपलायै
घने हिते सत्तवे प्रत्यघत्तम् ॥

R̥gveda—15th Rk., 1st Mandala, 116 Sūkta.

अगस्त्य पुरोहितः खेली नाम राजा तस्य सम्बन्धिनी विशपलानामस्त्री, संग्रामे शत्रुभिः छिन्नपदा आसीत् । पुरोहितेन अगस्त्येन स्तुतौ अश्विनौ राज्ञी आगत्य आयोमयं पादं समधत्ताम् । तदेतदाह 'आजा'—आजौ, संग्रामे, अगस्त्य पुरोहितस्य—खेलस्य राजतः सम्बन्धिनीः विशपलाख्याया, 'चरित्रं'—चरणं, 'वेरिव'—वेः पक्षिणः, 'पर्णं' पतत्रम् इव, 'अच्छेदि हि'—पूरा छिन्नमभूत् खलु । हे अश्विनौ ! युवां अगस्त्येन स्तुतौ सन्तौ, 'परितक्त्रायां'—रात्रौ, आगत्य, 'सद्यः'—तदानीमेव, 'सत्तवे'—सत्तूँ गन्तुम् इत्यर्थः, विशपलायै—'आयसौ',—लौहमयीम्, 'जङ्घ्रां'—जङ्घीपलक्षितं पादम्, 'प्रत्यघत्तम्'—सन्धानम् एकीकरणमित्यर्थः कृतवन्तौ ।

Sāyana's commentary.

we learn that when Parikṣit, the king of the Kurus, became certain of his approaching death by snake bite, due to a curse uttered by a sage, he tried to protect himself by the constant attendance of a number of physicians, who were well supplied with antidotes.¹ Again it is stated that when the great warrior Bhīṣma was wounded in war, the skillful army surgeons came to him with the necessary medical and surgical appliances to treat his wounds.² From the *Mohāvagga*, we learn that Jivaka, the personal physician of Buddha, practised cranial surgery with success.³ In the *Mālavikāgnimitra*, we find the use of charms a signet

- ¹ अमलः शल्यमिव न तथा शल्यमविवृत्
 शीघ्रं कर्तव्यमप्युक्तं प्रचलं
 यथाह विदुषस्तन्मित्रमविवृत्तं न
 शल्यममलमिव ह्यमलं विदुषोऽप्युक्तं

Mahābhārata, Ashv Parva, Ch. 42.

- ² अथानुसूयते विद्याः शल्योद्धारकोविदाः ।
 शल्योद्धारकोविदाः कुक्षी शल्योद्धारकाः ।
 शल्योद्धारकोविदाः शल्योद्धारकाः ।
 शल्योद्धारकोविदाः शल्योद्धारकाः ।
 शल्योद्धारकोविदाः शल्योद्धारकाः ।
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 शल्योद्धारकोविदाः शल्योद्धारकाः ।
 शल्योद्धारकोविदाः शल्योद्धारकाः ।

Mahābhārata, Bhishma Parva, Ch. 121.

Ys. 5745-5750. (A.S. B. 101.)

³ *Mohāvagga, VIII. 118.*

ring" as a healing talisman for the cure of snake-bite;¹ and also we find there a reference to a class of physicians who specialised themselves in Toxicology (Viṣa-Vaidya),² and were held in high esteem for their professional skill by the public.³ From the Bhojaprabandha, the administration of some kind of anæsthetic by inhalation before surgical operations can be ascertained. Similarly from the books of Law, we know the relations of the profession to society in general. In the Manusmṛhitā, we have unmistakable testimony of the decline of Hindu surgery as the author prohibits the eating of cooked rice from the hands of a surgeon.⁴

¹ सहि ! देवीए इदं सिप्पिसञ्जासादी आनीदखागमुद्दासणाहं अङ्गुलीअञ्जं सिणिहं
णिभालअन्ती तूह उवालभे पडिदस्सि ॥

Mālavikāgnimitra, Ch. I.

जय ।—जिदु जिदु भट्टा । धुवसिद्धी विखवेदी । उदकुम्भविषाणेण सप्पमुद्दिआ कप्पिदव्वा ।
मा अञ्जेसीअदुत्ति । धारि ।—एदं सप्पमुद्दअम् अङ्गुलीअञ्जम् । पच्छा मइ हत्थे णम् ।

Ibid, Ch. IV.

² परि ।—हेदी दंशस्य दाही वा चतस्यारक्तसीचक्षम् । एतानि दष्टमात्राणा-
मायुष्याः प्रतिपत्तयः ॥ (संप्रति विषवैद्यानाम् कर्मम् ।)

राजा ।—जयसेने ! ध्रुवसिद्धिः क्षिप्रमाह्वयताम् ॥

Ibid, Ch. IV.

³ निपु ।—पससमुद्भवन्ती दीसदि । अवि अ ध्रुवसिद्धिणा चिद्दस्सिदी । मा से
असङ्गणिज्जं पावं ॥

Ibid, Ch. IV.

⁴ चिकित्सकान्देवलकान्मांसविक्रयिणस्तथा ।
विपणेन च जीवन्ती वर्ज्याः स्युर्हव्यकव्ययीः ॥

Manusmṛhitā, Ch. III, 152.

चिकित्सकस्य शययीः क्रूरस्योच्छिष्टभोजिनः ।

उयात्रं सुतिकात्रं च पर्याचान्तमनिर्देशम् ॥

Ibid, Ch. IV, 212.

Secondly, monuments or inscriptions scattered about the country have to be searched, as references found therein to the science of medicine, are more trustworthy than documents which may have been more or less tampered with by interpolations of subsequent writers. Thus we learn from the Edicts of Aśoka, that hospitals were established by him in different parts of his kingdom, not only for the treatment of suffering humanity but also for the brute creation¹.

Thirdly, personages and scenes in connection with medical practice, and figures of herbs may have been represented in works of art which must be thoroughly examined. But unfortunately we do not possess any such work of art and so we can learn nothing to our purpose from this source. In the interpretation of the subject of the Friezes of the Ram Naur and Ganesha's Cave, Dr. R. L. Mitra says, - "The shamposang in the Ganesha Cave may be for a parent, but the close seat with the right hand round the neck of the male personage in the other, would be highly unbecoming in an unmarried female. But if the stooping figure be taken to be that of a wounded man, a wounded priest for instance, the lady may be a maiden nursing him without any offence to propriety. It is true that the appearance of the figure on the mattress does not indicate suffering from a wound, but in the Ram Naur frieze, the stooping head affords some indication of it."²

यत्तु विदितव्यम् यत्तु न विदितम् ।

यत्तु विदितम् यत्तु न विदितम् ।

Manusmṛiti, Ch. IV, 221

¹ Rock Inscriptions, Edict II.

² The Antiquities of Orissa, Vol. II, p. 11

Fourthly, the various kinds of surgical instruments preserved in museums are to be examined and the reports of finds of surgical appliances in various localities are to be studied. We know what a flood of light has been thrown on ancient Greek surgery by the steady progress of archæological discovery and finds of instruments at Pompeii, Herculaneum and elsewhere, and by the study of the specimens preserved in the Naples museum, the Athens museum and other museums of Europe. But as far as I have been able to trace, our museums contain no finds supplying us with any information on the subject.

Fifthly, the literature of medicine itself should be thoroughly inquired into and excerpts elucidative of our subject should be compared with one another. "The detailed descriptions of the very numerous Hindu instruments not being very minute or precise, Professor Wilson says, we can only conjecture what they may have been, from a consideration of the purport of their names, and the objects to which they were applied, in connection with the imperfect description given."¹ We are fortunate, however, in possessing a copious medical literature of great merit from very early times. We shall describe the important books in the introductory chapter, with short notices of their authors.

Sixthly, the comparative study of the science at the same period in other countries also furnishes us with valuable materials as regards the state of medicine in a country. It is well known that Sanskrit works are often written in a very terse language

¹ Royle's *Antiquity of Hindu Medicine*, foot-note, p. 59-60.

and it might be said with greater truth about the works of early Sanskrit authors, the comment of a learned critic about the style of Thucydides, the famous historian,—“the most obvious and characteristic of his peculiarities is an endeavour to express as much matter as possible in as few words as possible, to combine many thoughts into one, and always to leave the reader to supply something of his own. Hence his conciseness often becomes obscure.” I could not form any idea as to the shape of some of the surgical instruments from the descriptions given in the text books, and the commentators are often silent on those passages. But when I read the accounts of similar instruments in Greek and Roman literature, my difficulties at once cleared up. We know with what brilliant results comparative mythology and comparative philology have been studied of late years, and I am sure that a comparative study of medical science by scholars will lead to interesting discoveries. So I have added descriptions of the instruments according to the Greeks, Romans and Arabs at the end of the descriptions given in Sanskrit books : the former serving as commentaries on the latter.

Seventhly, in the accounts of historians, travellers and pilgrims from foreign countries, may be found notices of medical science, as they saw it practised during their sojourn in a country, and such impressions, if properly collated, may bear impartial testimony to the progress of the science at the time. Again, we must enquire if the original treatises of medicine can be proved to have been translated into different languages and whether the remedial agents of a country can be traced in the Pharmacopœias of different nations. Thus we

learn from the accounts of Houen Tsang and Fa Hian that charitable institutions such as hospitals, dispensaries and Pūnyasālās (Houses of Charity) were quite common in ancient India.¹ Arrian informs us in his *Indica* that the study of medicine among the Brahmans was in great favour.² We know that the standard works on medicine were translated in Arabic in the 8th Century B. C.,³ and that various medicinal herbs of Indian origin found their way into the Greek *Materia Medica*.⁴

Eighthly, we must enquire whether the medical practice of ancient times is still resorted to by the physicians of the present days. The Hindu system of medicine is still being practised all over India, more or less in its original form, and so can still be studied at first hand. But for our present purpose, we derive little or no help from the *Vaids* of the present generation. They know practically nothing about anatomy and surgery which began to decline during the Buddhist era, and finally all vestiges of the science became lost during the Mahomedan rule. I have spared no pains to exhaust these sources of information so far as surgical instruments are concerned. Whether or not I have been fortunate enough to give just the necessary details of instruments from the best accessible authorities without at the same time loading my pages with superfluous matter, must be left to the judgment of my readers to determine.

¹ Beal's *Buddhist Records of the Western World*, Vol. I., P. 165, 198 and 214; Vol. II., p. 188 and 303.

² Arrian's *Indica* c. 27.

³ Alberuni's *India*, Sachau's Preface, p. XXX—XXXI.

⁴ Royle's *Antiquity of Hindu Medicine*, p. 77-113.

Now it may be asked why the Science and Art of Surgery, which was successfully practised in Ancient India, is so much neglected by the present generation of *Vaid*s. So let us consider the causes that led to the downfall of Hindu Surgery:

1. The Hindus from a very early period have given up the dissection of human bodies—the only trustworthy method of acquiring anatomical knowledge—merely because it may occasion ceremonial uncleanness. The Ancient Hindus were, however, free from such prejudices. Manu lays down that mere bathing will purify a Brahman who has touched a corpse,¹ whilst stroking a cow or looking at the Sun, having only sprinkled his mouth with water will remove the defilement due to touching a dead bone.² But even in the *Manusamhitā*, we can trace the decline of Hindu surgery, and his law forbidding any one from eating food from the hands of a doctor evidently refers to a surgeon.³

2. The interference of the priests in India, as in Europe played an important part. They began to cure diseases by spells, charms, texts and drugs; and temples have served as consulting rooms for the treatment as much of the diseases

¹ दिवाकीर्त्तिमुदक्ता च पतितं सूतिकां तथा ।
शवं तत्सृष्टिर्न चैव सृष्ट्वा ज्ञानेन शुध्यति ॥

The Institutes of Manu, Ch. V, 85.

² नारं सृष्ट्वास्त्रि सन्नेहं खात्वा विप्री विशुध्यति ।
आचम्यैवं तु निस्नेहं गामालभ्यार्कमौक्ष्यवा ॥

Ibid, Ch. V, 87.

³ Ibid, Ch. III, 152; Ch. IV, vs. 212 and 220.

of the body as of the soul. The example of such a temple we still find in Tārakesvar where many sick people repair to have their anomalies cured by dreams, hypnotic suggestions and incubation or temple-sleep. Similar practice was prevalent in Egypt and Greece in olden times. The modern practice of using galvanic rings and abdominal belts is merely an advanced method of indulging in superstitious ideas.

3. The patients always dreaded the surgeon's knife—especially when the use of a general anæsthetic was unknown. At the same time, the comparative success of poultices, actual and potential cauteries, and other external applications have influenced the lay mind that operations by knife are not always needed.¹ The Hindu surgeons themselves believed in similar tenets, for Snāruta, the surgeon, remarks that "of all cutting instruments and their substitutes, caustics (or vegetable alkalies) are the most important, because by means of them, deep and superficial incisions and scarifications may be made, and derangements of the three humours (air, bile and phlegm) may be rectified"; and again he says that "with

१ दिव्यीषधि विना देहि प्रक्षयविद्या सुनिष्कला ।
 वेदस्य कुरुते या च दुर्बिकल्पये व्यथालरं ॥
 कायसं हि यथाशक्तिं पाटितानि पुनः पुनः ।
 किं न च प्रक्षलाय स्यात् सुनिर्देयमेविना ॥
 धातुना व्यापदि यच्च भेषजं मेव निवर्ति ।
 यामये पुनरं निकायं प्रक्षयं विधीयते ॥
 पुनः क्षणमनं न च धातुनाम् हि प्रक्षालये ।
 यदात्मन् लङ्घयति प्रक्षालयन्तो नवीति ते ॥

regard to surgical treatment, actual cautery is said to be superior to caustics, in as much as diseases treated with the actual cautery do not reappear, and because it can cure diseases which are incurable by medicines, instruments and caustics."¹ Thus we see that the Hindus were partial to external applications as a cure of surgical diseases, and gradually they neglected the surgical operations—one of the most important means of acquiring knowledge in Morbid Anatomy and of testing the correctness of diagnosis, in the absence of the post mortem examinations of the cadavers. Thus not only surgery but medicine also suffered materially.

4. The Hindus always cherish a high regard for the writings of their sages, and the earliest works on medicine became the standard works and were held sacred. Any violation of their opinions was considered a sacrilege; and all knowledge thus soon became stereotyped. In later times, none dared to question the validity of the statements contained therein, and though about three thousand years have elapsed, and though the votaries of the science are still honoured and wellpaid, the science instead of improving has markedly deteriorated. In fact, only two authors—Caraka and Suśruta—are original; the later authorities—and there is a vast number of them—were merely their servile copyists who only differed from them when they indulged in some grave errors. We have a parallel in the history of medical science in Europe, where Galen

¹ चारादग्निर्गरीयान् क्रियासु व्याख्यातस्तद्धन्तानां रोगानामपुनर्भावेऽङ्गुलशस्त्रादिर-
साध्यानां तत्साध्यत्वाच्च ।

held his sway over the profession for about two thousand years.

5. One of the potent causes of progressive decadence in the knowledge and practice of surgery amongst the Hindus is the rapid spread of Buddhism in India. Though Buddha sanctioned the use of the lancet in some cases, in cases of a doubtful nature he prohibited the use of instruments in the treatment of even surgical diseases. For example, he allowed the surgical treatment of boils by knife,¹ but he prohibited not only the use of the lancet for treatment of fistula-in-ano but the use of clysters also.² As it would be interesting to know the reasons of this prohibition, I quote the story in full from the *Mohāvāgga* (Sacred Books of the East) :³

1. Now when the Blessed One had remained at Sāvattthi as long as he thought fit, he went forth on his journey to Rāḡagaha ; and wandering straight on he arrived at Rāḡagaha ; and there at Rāḡagaha he stayed at the Veluvana in the Kalandaka-nivāpa.

Now at that time a certain Bhikkhu was suffering from fistula. And the physician (named) Ākāsa-gotta² lanced it. And the Blessed One when he was going round through the sleeping-places came to the place where that Bhikkhu dwelt.

2. Ākāsa-gotta, the physician, saw the Blessed One coming from afar ; and when he saw him he said to the Blessed One : ' Let the venerable Gotama come and look at this Bhikkhu's orifice ;

¹ *Mohāvāgga*, VI. 14. 4 & 5.

² *Ibid*, VI. 22. 3.

³ *Ibid*, VI. 22.

it is like the mouth of an iguana!’ And the Blessed One thinking, ‘This foolish fellow is ‘making fun of me,’ kept silence and turned away. And in that connection, and on account of that, he called a meeting of the Bhikkhu-saṅgha, and asked the Bhikkhus: ‘Is there, O Bhikkhus, in that Vihāra a Bhikkhu who is sick?’

‘There is, Lord.’

‘What is the matter, O Bhikkhus, with that Bhikkhu?’

‘That venerable one, Lord, has a fistula, and Âkāsa-gotta the physician, has been lancing it.’

3. The Blessed Buddha rebuked (that Bhikkhu), saying, ‘This is improper, O Bhikkhus, for that foolish one, unbecoming, indecent, unworthy of Samanas, not allowable and ought not to be done. How can this foolish fellow, O Bhikkhus, allow a surgical operation to be performed in that part of his body? The skin there, O Bhikkhus, is tender, the wound is difficult to treat, the knife is difficult to guide. This will not redound, O Bhikkhus, to the conversion of the unconverted.’

And having rebuked him, the Blessed One, after delivering a religious discourse, said to the Bhikkhus: ‘You are not, O Bhikkhus, to allow a surgical operation to be performed upon you in that part of your bodies. Whosoever allows that, is guilty of thullakaya offence.”

4. Now at that time Khabbaggiya Bhikkhus, since a surgical operation had been forbidden by the Blessed One, used a clyster.

They told this thing to the Blessed One.

'Is it true, as they say, O Bhikkhus, that the Khabbaggiya Bhikkhus use a clyster ?'

'It is true, my Lord.'

He rebuked them, and having delivered a religious discourse, said to the Bhikkhus: 'No surgical operation is to be performed within a distance of two inches round the anus, and a clyster is not to be used. Whoever does so, is guilty of a *thullakkaya* offence.'

And thus we find that Jivaka, the famous surgeon, is said to have cured a case of fistula-in-ano by the single application of an ointment.¹ The operation fell into such disuse that when Śaṅkarāchāryya suffered from the same disease, no surgical aid was thought necessary by the physicians, though it is said that he was treated by renowned doctors of the time.²

From Megasthenes, we learn that "among the Sarmans the Hylobii (living in woods) were held in most honour, and next to them the physicians, who are mendicants and also necetia, like the class above them and the class below them,

¹ "And Jivaka Komārabhalla healed the fistula of the Magadha King Seniya Bimbisāra by one anointing."

Mahāvāgga (Sacred Books of the East), VIII. 1. 15.

² चरित्रविश्वामित्रायाम् वीरमित्राय चरित्रविश्वामित्राय ।

चरित्रविश्वामित्रायाम् वीरमित्राय चरित्रविश्वामित्राय ।

• • • • •

विश्वामित्राय चरित्रविश्वामित्राय चरित्रविश्वामित्राय ।

न च विद्वान्महामित्राय चरित्रविश्वामित्राय ।

which consisted of sorcerers and fortune-tellers;"¹ and Strabo² mentions that these physicians "cured diseases by diet rather than by medicinal remedies, which were chiefly unguents and cataplasms."³

6. No science can flourish without the support of the government of the day. The Hindus became a subject race; and any *départure* from the traditional store of knowledge in the shape of improvement in the quality and additions to its quantity was neither tolerated by the people, who are proverbially conservative, nor countenanced by the royal court, for the conquerors brought with them and patronised their own hakeems and doctors. Neither the Mahomedans nor the English have taken any real interest in the Indian Medical Science from preconceived notions that it contains nothing worthy of their perusal. The *Kavirajes* again are so conservative in their opinions that they can not boldly advocate even the use of such drugs as are of unquestionable value in the treatment of diseases, as for example the use of Quinine in Malaria. To this may be contrasted the behaviour of Bhāvamīśra, who lived about three hundred years back and who adopted many medicaments of foreign origin. The consequence can easily be imagined, and in the language of Elphinstone, can be thus described: "Physicians follow the practice of their instructor without inquiry, and surgery is so far neglected, that bleeding is left to the barber, bone-setting to the herdsman, and every one is ready to administer

¹ The Invasion of Alexander the Great. M'Crindle. Appendices. p. 358.

² Geography, XV. i. 58-60.

³ The Invasion of Alexander the Great. M'Crindle. Appendices. p. 368-69.

a blister, which is done with the juice of the euphorbium and still oftner with the actual cautery."¹

But we need not enlarge any further. The object of this essay is not to write out an exhaustive dissertation on the Hindu medical science but by a few suggestive facts, however imperfect and fragmentary, to stimulate curiosity and divert attention of the diligent scholars to a vast field of research, which seems as yet to have been only partially explored.

It is proper here to acknowledge that I have on all occasions freely availed myself of the labours of Drs. Wise, Thakore Sahib of Gondal, and the translators of *Suśruta Saṁhitā* in the Bibliotheca Indica, namely, Dutt and Hoernle. It is a great pity that this translation has not as yet progressed beyond three fasciculi. Hoernle's recent contribution, "Osteology of the Hindus," is a move in the right direction and we hope it to be followed by similar enquiries in other branches of the science. Royle for the first time proved beyond doubt the high antiquity of Hindu medicine, and established its right position in the history of the science. Wise is the pioneer of systematic research in this field of study, and his sympathetic appreciation of the Hindu system of medicine will always be remembered with gratitude by our countrymen. Dutt's *Materia Medica of the Hindus* is a work of great merit; and I have derived material assistance from the excellent treatise, "History of Aryan Medical Science," by the Thakore Sahib of Gondal. Dr. Ray's *History of Hindu Chemistry* is a valuable contribution in the cognate subject of chemistry. I have borrowed from these writers largely, but

¹ Elphinstone's *History of India*, 5th Ed., p. 100.

I flatter myself it will also be found that I have further collected from various sources a store of valuable information, for which I am in no way indebted to any of my predecessors in the same field of research. The descriptions of the surgical instruments of the Greeks, the Romans and the Arabs, I have taken from the excellent English translations of Paulus Ægineta, the Extant Works of Ætius and the Genuine Works of Hippocrates, prepared by the renowned Adams, for the Sydenham Society. I have also laid the recent monograph, "Surgical instruments in Greek and Roman times" by Dr. Milne, largely under contribution; I only regret that I had no access to the book a little earlier, otherwise much of my labour in search for descriptions of the instruments of the Greeks would have been saved. For the last five years, I have been engaged on this investigation and it was when I had nearly finished, that Milne's book was mentioned to me by the Hon'ble Mr. Justice Asutosh Mookerjee, the Vice-Chancellor of the Calcutta University and the President of the Asiatic Society of Bengal.

To complete the subject, I have added plates of nearly all the varieties of instruments; but they are more or less hypothetical as we do not possess any actual specimens of the instruments of the Hindus. Written descriptions of surgical instruments are uninteresting and often fail to convey the true idea, which could be easily made evident by the pencil. For purposes of comparison I have given drawings of instruments of the Greeks, the Romans and the Arabs, when I thought that they might be of value for the proper elucidation of my subject. I am indebted to many authors

I am indebted to many authors for some of the engravings of the instruments. I have been careful to give the source whence the borrowed ones are taken, as far as I have been able to ascertain them. If this has been omitted in any case, it is from inadvertence, not from design. My best thanks are due to them and I here acknowledge my indebtedness to the authors for availing myself of their labours without their permission. But many new illustrations will be found, and I have appended my name to those drawn by myself. These figures of the surgical instruments would be found to tally better with the descriptions of the instruments given in the Sanskrit books than the illustrations of the previous authors. The drawings of surgical instruments as given by me would look more like the figures in a modern catalogue of surgical instruments. Some of my friends could hardly believe when they saw the plates that these instruments were known to the ancient Hindus at such an early age. This feeling of amazement and incredulity as regards the surgical instruments used by the ancient Hindus has its parallel in the observations of Billroth¹ about the surgical instruments found in the excavations at Pompeii and now preserved in the museum at Naples. He says: "It made a peculiar impression upon me, when I saw before me this two thousand years old surgical armamentarium of a Roman colleague, differing but slightly in the form of the more ordinary instruments from those of our time. *Ars longa vita brevis.*" Milne² also remarks: "The works of those (Paré, Scultetus and Heister) are profusely illustrated with instruments, some of which can plainly be seen to tally exactly with the descriptions of the classical authors."

¹ Billroth's Surgery, Vol. I, Introduction, Page 7. Syd. Soc. Ed.

² Græco-Roman Surgical Instruments, P. 8.

In describing the surgical instruments, I have confined myself strictly to the texts of the authors and commentators whom I have quoted, and have given the original Sanskrit passages in the foot-notes. These will be of great help to scholars who will try to study the subject at first hand, and prosecute further historical inquiries. The references in the foot-notes do not refer to pages of any particular edition of the work, as such pagination causes inconvenience to the readers who may not secure the edition in question; so we have given the section, and chapter of the book which will be found in any edition.

In the translations of Sanskrit passages, I have endeavoured to follow the original as closely as possible, except where a somewhat free rendering was necessary to make the meaning clear.

The dates of the ancient Hindu authors of Sanskrit medical books cannot be ascertained with certainty. In the first chapter I have endeavoured to discuss briefly their approximate ages. But as I have compared the surgical instruments of the ancient Hindus with those of the Greeks, Romans and Arabs, a concise summary of the chronological dates of the Græco-Roman, Arab, and the later authors would be a great help in the proper elucidation of my text.

<i>Authors.</i>	<i>Date.</i>
Pythagoras ...	580-504 B.C.
Megasthenes ...	300 B.C.
Ktesias ...	400 B.C.
Hippocrates ...	460 B.C.
Hero of Alexandria ...	285-222 B.C.

<i>Authors.</i>	<i>Date.</i>
Dioscorides ...	... First century A.D.
Celsus ...	... 25-30 B.C. to 45-50 A.D.
Scribonius Largus ...	... 45 A.D.
Soranus ...	... First century A.D.
Rufus of Ephesus ...	... 98-117 A.D.
Galen ...	... 131-201 A.D.
Marcellus Empiricus ...	... 300 A.D.
Antyllus ...	... 3rd century, A.D.
Oribasius ...	... 326-403 A.D.
Theodore Priscianus ...	... 4th century A.D.
Caelius Aurelianus... ..	... 4th or 5th century A.D.
Moschion ...	... 5th century A.D.
Actius... ..	... 5th century A.D.
Alexendar of Tralles ...	... 525-605 A.D.
Paulus Ægineta ...	... 660 A.D.
Serapion ...	... 800 A.D.
Rhazes ...	... 850-932 A.D.
Haly Abbas ...	... After 950 A.D.
Avicenna ...	... 980-1037 A.D.
Abul Cassim ...	... x 1106 A.D.
Avenzoar ...	... x 1162 A.D.
Paré ...	... 1509-90 A.D.
Scultetus ...	... 1650 A.D.
Heister ...	... 1739 A.D.

I can not suffer this work to go forth without offering at least an explanation of, if not an apology for, the delay which has occurred in the publication of this thesis. It is mainly due to the accidental fire which reduced the types and the blocks

for this work to ashes and destroyed a part of the manuscript. This portion had to be written again. Again the task of reading proof sheets was laid on me entirely. The occupation of a laborious profession encroached on my time; and I was not fortunate enough to secure the co-operation of any worker in this field of research. The result might be anticipated and no one is more conscious of the unsatisfactory issue than myself. I had no experience in proof reading, and so mistakes are not uncommon. Some of the errors will be found corrected in the corrigenda. As regards the corrections of many of the proof sheets of the Sanskrit foot-notes I was assisted by my son Hirendranāth Mukhopādhyāya, who helped me much in getting this book completed. The author will feel obliged if informed of any errors that may be detected and of references to informations which ought to have been given, and also for any hints that may make a future edition more useful to the readers. But I have this consolation in my mind that I have not pushed this work through the press hurriedly or prefunctorily and I have done my best. I have laboured with the usual drawbacks of an active professional life and if this be admitted by the critic as an excuse for errors and failures, I shall be grateful to him.

A copious index has been provided for this work, whereby anything material in the whole book may be readily found out; of which it may be said that it wants no other advantages than such as the author had not power to give.

It would not be out of place here to mention that part of this essay was read before the Asiatic Society of Bengal in June, July and August, 1908. The learned President in his annual address remarked as follows: "In the course of the last

for this work to ashes and destroyed a part of the manuscript. This portion had to be written again. Again the task of reading proof sheets was laid on me entirely. The occupation of a laborious profession encroached on my time; and I was not fortunate enough to secure the co-operation of any worker in this field of research. The result might be anticipated and no one is more conscious of the unsatisfactory issue than myself. I had no experience in proof reading, and so mistakes are not uncommon. Some of the errors will be found corrected in the corrigenda. As regards the corrections of many of the proof sheets of the Sanskrit foot-notes I was assisted by my son Hirendranāth Mukhopādhyāya, who helped me much in getting this book completed. The author will feel obliged if informed of any errors that may be detected and of references to informations which ought to have been given, and also for any hints that may make a future edition more useful to the readers. But I have this consolation in my mind that I have not pushed this work through the press hurriedly or prefunctorily and I have done my best. I have laboured with the usual drawbacks of an active professional life and if this be admitted by the critic as an excuse for errors and failures, I shall be grateful to him.

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session Dr. Girindranath Mukerjee submitted to the society a paper of considerable extent, in which he elaborately examined the subject of the surgical instruments of the ancient Hindus. The questions he has raised, as to the priority of Hindu medicine over that of the Greeks, the Romans and the Arabs, are likely to arouse controversy, but in whatever way the question of priority may be decided, it seems to me truly remarkable that the descriptions given in our most ancient books on medicine, of the surgical Instruments then in use, should bear a close resemblance to the descriptions given not only in Greek, Roman and Arab medical writings but in many cases with the descriptions given in modern works on surgery. I trust that this subject, so peculiarly Indian, will not be left alone and will receive the attention from investigators which it undoubtedly deserves.”¹

As regards the transliteration of Sanskrit words, we have employed the method adopted in the Congress of Orientalists and circulated in the Journal of the Royal Asiatic Society, ignoring in fact, the unpleasant characters of the Sacred Book of the East.

¹ Journal and Proceedings of the Asiatic Society of Bengal, Vol. V, 1909, Annual Address, p. XXX.

I

SANSKRIT AND ALLIED ALPHABETS.

अ a	ओ o	ट t	ब b
आ ā	औ au	ठ th	भ bh
इ i	क k	ड d	म m
ई ī	ख kh	ढ dh	य y
उ u	ग g	ण ṇ	र r
ऊ ū	घ gh	त t	ल l
ऋ ṛ	ङ ṅ	थ th	व v
ॠ ṝ	च c	द d	श ś
ए e	छ ch	ध dh	ष ṣ
ऐ ai	ज j	न n	स s
	झ jh	प p	ह h
	ञ ñ	फ ph	ळ ḷ

• (Anusvāra) . . . m	ˆ (Avagraha) . . . ˆ
˘ (Anunāsika) . . ṁ	Udātta . . . ˆ
: (Visarga) . . . ḥ	Svarita . . . ˜
× (Jihvāmūliya) . ḥ	Anudātta . . . ˆ
⋈ (Upadhmānīya) ḥ	

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and commentaries. Vāgbhaṭa I,—Aṣṭāṅga Saṁgraha, his age, edition and commentary; Vāgbhaṭ II: Aṣṭāṅga Hṛdaya Saṁhitā, editions and commentaries; Vagbhaṭā III—Rasa Ratna Samuccaya; Mādhavakara:—Nidāna; Vṛnda Madhava:—Siddhayoga; Cakrapāṇi-datta:—Cikitsāsāra Saṁgraha, editions; Śāraṅgadhara:—Śāraṅgadhara Saṁgraha, editions and commentary; Bhāva Miśra:—Bhava Prakāśa, editions.

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1. The Svastika yantra or cruciform Instruments:
 - Sinhāmukha svastika or Lion-faced forceps.
 - Vyāghramukha or Tiger forceps. Vṛkamukha or Wolf forceps. Tarakṣumukha or Hyena forceps. Rkṣamukha or Bear forceps.
 - Dwipimukha or Panther forceps. Mārjāramukha or Cat forceps. Śṛgālamukha or Jackal forceps. Airbbāruka or Deer forceps. Kākamukha or Crow forceps. Kaṅkamukha or Heron forceps. Kuraramukha or Osprey forceps. Cāsamukha or Blue-Jay forceps. Bhāsamukha or Eagle forceps. Śaśaghātīmukha or Hawk forceps. Ulukamukha or owl forceps. Cillimukha or Kite forceps. Syenamukha or Vulture forceps. Gṛdhramukha or Falcon forceps.

Krauñcamukha or Curlew forceps. Bhr̥ṅgarāja-mukha or Butcher-bird forceps. Añjalikarna forceps. Avabhañjanamukha forceps. Nandimukha forceps. II. The Sandamśa or Pincher-like forceps: Forceps with and without handles. Forceps with Smooth and rough ends. Epilation forceps. Mucutī or Mucundī. Vamśabidala or Bamboo forceps. III. Tāla-Yantra or Picklock-like instrument: Ectāla and Dvitāla. The Ear-scoop. IV. The Naḍi-Yantra or Tubular instruments: Kaṇṭhaśalyā-valokinī or Throat speculum. Pañcamuka and Trimukha. Tubular instruments for inspection of arrows. Śalyanirghātani. The Impellent. Tubular instruments for Piles—for inspection and medication. Śamī. The Rectal Speculum. Calopter. Tubular instruments for the Fistula-in-ano. Tubular instruments for the nose: Nasal Speculum. Nathu-karani and Yamaka-nathu-karani. Nasal tubes. The Aṅguli-trāṇaka or Finger-guard. Yoni-Vraṇekṣana or Vaginal Speculum. Diopter. Bivalve Speculum. The tubular instruments for wounds—Vraṇa-vasti or Wound-Syringe. Tubular instrument for ascites. Dākodara yantra or Canula. Tubular instruments for Hydrocele. Tubular instruments for rectal stricture. Tubular instruments for injection into the rectum—Vasti Yantra or Rectal clyster. Uttaravasti or urethral, vaginal and uterine tubes. Catheters. Tubular instruments for inhalation and fumigation. Disinfection of rooms, clothes &c. Tubular instruments for cupping. Śrūga or horn. Alābu Yantra or gourd. Ghati Yantra, V. Śalākā

or rods: Earthworm probes. Arrow probe. Snake's hood probe. Fish-hook probes. The Śaṅku; Swab probe. Spathomele or spatula probe. Spoon-shaped probes. Cyathiscoemele. Nail-shaped probes. Jāmvavauṣṭha probe. Gamma-shaped probe and the aṅkuśa cautery. Collyrium probes. Karṇa Śodhana or Ear-cleaner. Garbha-Śaṅku or Fœtus or Traction hook. Yujña-Śaṅku or Midwifery forceps. Sarpa-faṇa or snake's hood-like rods. Stone extractor. Hippocratic oath. Sarapuṅkha-mukha Probe. Arddhacandramukha or Half-moon Probe. Bone Lever. Director. Urethral Probe. VI. The Upayantra or Accessory Instruments. Rajju or thread, Venikā or twine; Paṭṭa or Bandages, Abdominal binder, Field Hospital, Dressings. Carma or leather: leather bandage, leather ligatures. Yantra-Śaṭaka or Lithotomy Strap or binding apparatus, Pāśa. Leather bags. Śirovāsti or leather-bag for the head. Leather Band. Leather Bottles, Jars, etc. Antarvalkala or Barks. The crutches, Tendrils of creepers or Latā. Vastra or cloth. Aṣṭhilāṣma or stone. Mudgara or Hammer. Pāṇipadātala or hand and foot. Aṅguli or fingers. Jihvā or tongue. Danta or tooth. Nakha or nails. Mukha or mouth. Vāla or hair. Probang. Suture material. Aśvakaṭaka or the ring of a horse's bridle. Śākhā or branch of a tree. Sthivana or spittle. Pravāhana or fluxing the patient. Harā or Happiness. Ayaskānta or Load-stone. Kṣāra or Caustics or Potential cautery. Agni or Actual cautery. Bheṣaja or medicines. Goats' gut; Arrest of hæmorrhage.

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CORRIGENDA.

Page	ii	F. N. 3		
"	xi Para 5			
"	xi ...	F. N. 1		
"	xiii ...	" 1	} read Mahāvagga for Mohāvāgga.	
"	82 line 4	" 1		
"	116 " 23	" 5		
"	182 " 10, 15	" 2		
"	x " 10	...		
"	202 " 1 of para. 5 ...			
"	203 " 2 & last line ...			
"	262 " 12	...		
"	308 ...	" 1	} " diagnosis " diagnosis.	
"	317 " 10	...		
"	319 ...	" 3		
"	320 " 5	" 1		
"	xiii ...	" 2		
"	xv ...	...	" Vijaya	" Vejaya.
"	3 ...	" 1 & 2 }	Bibliotheca	" Bibliotheca.
"	303 ...	" 1 }	" Macdonell	" Macdonnel.
"	4 ...	" 1	" Dārila	" Dārīta.
"	17 ... 7	...	" Bhānumati	" Vānumati.
"	27 item 8	...	" Rabi	" Robi.
"	30 ...	" 1 }	" Archæo	" Archæo.
"	12 ...	" 3 }		
"	31 ...	...	" Śārīngadhara	" Śārāngadhara.
"	35 ... 13 }	...	" Skilful	" Skillful.
"	40 " 8 }	...		
"	37 " 11	...		
"	39 " 23	...		
"	40 " 14	...		
"	70 "	" 3 }	" Vṛddha	" Vṛddhya.
"	71 ...	" 1 & 3 }		
"	87 ... 2 & 4	...	" Kapāṭa	" Kapāṭa.
"	88 " 13	...		
"	99 " 8	...	" Pālakāpya	" Pālakāpya.
"	109 " 8	...	" Śālya	" Śālya.
"	117 " 5	...	" bambo	" bambu.
"	119 " 19	...	" Barnes'	" Barnes.
"	120 " 21	...	" Sorts	" Shorts.

CORRIGENDA.

xxxi

Page 159	line 13	...	read	Jāmvovauṣṭha	for	Jamvovouṣṭha.
" 178	item 10	...	"	Cīna	"	Chīna.
" 181	...	" 2	"	Obstetric	"	Obstetire.
" 196	line 12	...	"	Gayadāsa	"	Gayadāssa.
" 219	" 14	...	"	Sesamum	"	Seasum.
" 219	" 21	...	"	effectual	"	effectnal.
" 221	item 3	...	"	Pācana	"	Pāchana.
" 242	line 2	...	"	Parietes	"	Parietis.
" 262	" 10	...	"	Round...four	"	four cornered...
				cornered		.....round.
" 285	" 15	...	"	Hippo	"	Hyppo.
" 295	" 3	...	"	Requisites	"	Requisities.
" 306	" 11	...	"	Yaṣṭhi	"	Yaṣṭi.
" 311	item 2	...	"	octagonal	"	octogonal.
" 328	" 3	...	"	hātā	"	hata.
" 331	line 18	...	"	Jolly	"	Jolley.
" 340	" 5	...	"	Physician	"	Physian.
" 346	" 18	...	"	amber	"	ambar.
" 348	" 2	...	"	Paitamaha	"	Paitāmoha.
" 352	" 22	...	"	Firoz	"	Firroz.
" 354	" 11	...	"	Areca	"	Arecha.
" 355	" 12	...	"	Dvārusita	"	Davrusita.

WORKS BY THE AUTHOR.

1. Muscles of the Human Body, arranged in Tabular form
Fourth Edition. Rs. 1

2. Tropical Abscess of the Liver.

Thesis approved for the degree of Doctorate in Medicine
Madras University. Rs. 5

3. Glossary of Indigenous Medicinal Plants.

(In the Press)

4. Notices, Biographical and Bibliographical, of the Hindu
Physicians and their Works on Medicine.

(In the Press)

5. Medicine in the Vedic times

(In preparation)

**THE STAR MEDICAL HALL,
80, Russa Road North, Bhawanipur,
CALCUTTA.**

THE Surgical Instruments of the Hindus.

CHAPTER I.

INTRODUCTION.

ANCIENT MEDICAL AUTHORS AND THEIR WORKS.

The Science and Art of Medicine, like many other different branches of learning originated with the Hindus. They consider the art of healing as an Upaveda and it is generally known as Āyurveda, that is the art of prologing life. Like the Vedas, they trace the origin of the science to God, the fountain of all true knowledge. Bramhā transmitted this heaven-born science to this world for benefit of the mortals in one of the sacred writings, the Āyurveda.

It was composed as a sub-division of the Atharva Veda and consisted originally of a *lālch slokas* or a hundred thousand stanzas, divided into a thousand chapters. Then considering the short span of life and inadequate intelligence of man, he divided the book into eight parts¹ as follows:—

¹ तद्यथा ॥ शल्यं शालाक्यं कायचिकित्सा भूतविद्या कौमारभृत्यमगदतन्त्रम्
रसायनतन्त्रं वाजीकरणतन्त्रमिति ॥

Sūsruta Samhitā, I. i.

कायचिकित्सा शालाक्यं शल्यहृत्कं विषगरवैरोधिकप्रश्ननं भूतविद्या कौमारभृत्यकं
रसायनानि वाजीकरणमिति ।

Caraka Samhitā, I. xxx.

वेदी ह्याथर्व्वः स्वस्थयनवलिमङ्गलहीमनियमप्रायश्चित्तोपवासमन्त्रादिपरिग्रहात् चिकित्सा
प्राह ।

Ibid.

1. Śalya Tantra or Major Surgery.
2. Śālākya Tantra or Surgery of parts above the Clavicles.
3. Kāya Cikitsā or Inner Medicine.
4. Bhūtvidyā or Demnology.
5. Kaumārabhṛtya or the Science of Pædiatrics.
6. Agada or Toxicology.
7. Rasāyana or Treatment to prolong life.
8. Vājīkaraṇa or Treatment to stimulate the sexual power.

The book is no more available now, Suśruta being the authority for the above information.¹

A different view is held by others, who trace the origin of Hindu Medicine in the verses of the R̥gveda.²

¹ इह खल्लायुर्वेदी नाम यदुपाङ्गमथर्ववेदसंज्ञात्वादैव प्रजाः स्त्रीकशतसहस्र-
मध्यायसहस्रञ्च कृतवान् स्वयम्भूः । ततोऽस्यायुःसमस्यमेधस्ताच्चावलीक्य नराणां भूयोऽष्टधा
प्रणीतवान् ॥

Suśruta Saṁhitā, I. i.

तच्च चेत् प्रथारः स्युः चतुर्णां च कसामयजुरथर्ववेदानां कं वेदमुपदिशन्त्यायुर्वेदविदः ।
किमायुः कस्मादायुर्वेदः किञ्चायमायुर्वेदः ब्राह्मवतीऽशाश्वत इति । कानि चांसाराङ्गानि
कस्यायमधिगतव्यः किमर्थञ्चेति ॥

तच्च भिषजा पृष्ठेनैवं चतुर्णां च कसामयजुरथर्ववेदानाम् आत्मनोऽथर्ववेदे भक्तिरादेश्या ।

Caraka Saṁhitā, I. xxx.

The origin of medical science, as quoted in the above passage of Caraka, does not however agree with the view expressed by the author in the Sūtra Sthāna, Ch. I. (See footnote 1. P. 4). In Ch. XXX, we find that an attempt had been made to make a compromise between the two views of Agniveśa and Suśruta. Evidently this was the work of a later redactor, possibly Dr̥ḍhavalā.

न ह्यायुर्वेदसंज्ञाभूलीकितरूपलभ्यते । अन्यच्चावलीक्योपदेशाभ्यामेतद्वै इयमधिकृत्य उत्पत्ति-
मुपदिशत्येकं स्वाभाविकञ्चास्य लक्षणमधिकृत्य यदुक्तम् इह चाद्येकाङ्ग्यायि * * * ॥

² अथवेदसंज्ञायुर्वेद उपवेदः ।

Caraka Saṁhitā, I. xxx.

Carana Vyūha by Vyāsa.

ATHARVA VEDA.

"On examining the contents of the Atharva Veda more in detail, we find that the hostile charms it contains are directed largely against various diseases or the demons which are supposed to cause them. There are spells to cure fever (takmān), leprosy, jaundice, dropsy, scrofula, cough, ophthalmia, baldness, lack of vital power, fractures and wounds; the bite of snakes or injurious insects, and poison in general; mania and other ailments. These charms are accompanied by the employment of appropriate herbs. Hence the Atharva Veda is the oldest literary monument of Indian Medicine."¹ This Veda can not belong to a period later than 1000 B. C., but possibly earlier.² It exists in the recensions of two different schools. That of the Paippalāda is only known in manuscript, discovered by Prof. Buhler in Kashmir and described by Prof. Roth in his tract *Der Atharva Veda in Kaschmir* (1875). The printed text, edited by Roth and Whitney in Berlin 1856, gives the recension of the Śaunaka School.³ It has been translated into English Prose by Whitney, 2 Vols.; into English verse by Griffith, 2 Vols., Benares, 1897, and with the omission of the unimportant

¹ Modonnel's Sanskrit Literature, P. 196.

अथर्ववेदस्य * * * * चतुर्थं वेदलेऽपि प्रायेणाभिचारवर्धलादयश्च विद्यायामनुप-
योगाच्चानिर्देशः। तथाहि ऋग्वेदेनैव हौचं कुर्वन् यजुर्वेदेनाध्ययं सामवेदेनौद्गाचं
यदेव चैव विद्याय सूक्तेन ब्रह्मत्वमित्युते स्वयंसम्पाद्यत्वं यज्ञानां ज्ञायते।

Kallūka Bhaṭṭa's Commentary on Manu Samhitā, Ch. III, Śloka I.

² On the date of Atharva Veda, see pp. CXL—CLXI, Prof. Lanman's Edition of Whitney's Transl.; Prof. Modonnel's Sanskrit Literature, pp. 185—201.

³ Index Vervorum in the Journal of the Am. Or. Soc. Vol. XII.

hymns, by Bloomfield¹ into English Prose, with notes, in Vol. XLIII of the Sacred Books of the East.

CARAKA SAMHITĀ.

In the Caraka Samhitā we find that Brahmā taught Dakṣa the science of medicine; Dakṣa became the preceptor of the Aśvin twins; they in their turn became the teachers of Indra and Indra imparted this knowledge to Bharadvāja who was sent by a conclave of sages to learn the art for the welfare of the human race.² Bharadvāja had Punarvasu Ātreya and the others as disciples. Ātreya's students were Agniveśa, Bhela, Jatukarṇa, Parāśara, Hārīta and Kṣūrapāṇi, all of whom became celebrated as the authors of treatises on Medicine; the Caraka Samhitā being a revised and improved edition of the treatise of Agniveśa, which was declared to be the best production.³ Caraka did not, however, redact the whole

¹ He has also edited the Kauśika Sūtra of the Atharva Veda, with extracts from the commentaries of Dārīta and Kośava (see Vol. XIV Journ. Am. Orient. Soc.). It is very useful as a help to the proper understanding of the meaning of a hymn.

² दीर्घजीवितमखिच्छन् भरद्वाज उपगमत् ।

इन्द्रमुद्यतपा बुद्धा शरण्यममरेश्वरम् ॥

ब्रह्मणा हि यथा प्रीतमायुर्व्वेदं प्रजापतिः ।

जयाह निखिलेनादावश्विनो तु पुनस्ततः ॥

अश्विभ्यां भगवान् शक्रः प्रतिपेदे ह केषलम् ।

ऋषिप्रीती भरद्वाजसस्माच्छक्रमुपागमत् ॥

³ अथ मैत्रीपरः पुण्यमायुर्व्वेदं पुनर्व्वसुः ।

शिष्येभ्यो दत्तवान् षड्भ्यः सर्व्वभूतानुकम्पया ॥

अग्निवेशश्च मेखश्च जतुकर्णः पराशरः ।

हारीतः चारपाणिश्च जगद्भुक्तमुनेर्व्वचः ॥

बुद्धेर्व्विशेषश्चासीन्नोपदेशान्तरं मुनेः ।

तन्मस्य कर्त्ता प्रथममग्निवेशो यतोऽभवत् ॥

अथ मेलादयश्चक्रुः स्वं स्वं तत्त्वं कृतानि च ।

आवयासासुराचैवं सर्षिसद्वं सुमेधसः ॥

Caraka Samhitā, I, i.

book;—the last forty-four chapters¹ were edited by Drḍhavalā,² a native of Panchanadapura, long supposed to refer to Punjab (the land of five rivers) but at present identified with a town in Kashmir by Dr. Hoernle.³ Two other works, the treatises of Bhela and Hārīta, are still extant; the former existing in manuscript in the Tanjore Library⁴ and the latter as printed texts by *Kavirājes* K. C. Sen and B. L. Sen, of Calcutta.⁵

Now as regards the age of Caraka, there is great divergence of opinions. The Indians generally believe him to be a R̥ṣi of great antiquity while the European scholars try

¹ For a discussion on the part added by Drḍhavalā, see Hoernle's *Studies in Ancient Indian Medicine*, J. R. A. S. 1908, P. 997-1002. Also see pp. 11-15 in the *Vanaśadhi Darpaṇa*, Vol. I., by Kavirāja Birajā Charan Gupta, 1908.

² अतस्तन्नीतममिदं चरकेणातिबुद्धिना ।

संस्कृतं तत् तु संसृष्टं विभागेनीपलक्ष्यते ॥

इदमन्यूनशब्दार्थं तन्मं दीपविवर्जितं ।

अखण्डार्थं दृढवली जातः पञ्चनदी पूरे ॥

कृत्वा बहुभ्यस्तन्मेभी विशेषाच्च वलीक्षयम् ।

सप्तदशोषधाध्यायसिद्धिकल्पैरपूरयत् ॥

Caraka Saṁhitā, VIII, xii.

अस्मिन् सप्तदशाध्यायाः कल्पाः सिद्धय एव च ।

नासाद्यन्तेऽग्निवेशस्य तन्मे चरकसंस्कृते ॥

तानेतान् कापिलवलः शेषान् दृढवलीऽकरीत् ।

तन्मस्यास्य महार्थस्य पूरणार्थं यथातथम् ॥

Ibid, VI, xxx.

³ Hoernle's *Studies in the Medicine of Ancient India*, Part I, Osteology, Introduction, p. 2. See also his article on "The authorship of Caraka Saṁhitā" in the *Archiv für die Geschichte der Medizin*, 1907.

⁴ See Burnell's Tanjore Catalogue No. 10773 of Sanskrit Mss., P. 63.

⁵ It is doubtful whether the Hārīta Saṁhitā is the genuine work of the R̥ṣi, Hārīta. The printed text refers to Caraka, Suśruta and even Vāgbhaṭa, who were decidedly posterior to Hārīta, See the Footnote 3, P. 6.

to connect him with historical events of more modern times. Sylvain Lévi has recently discovered in the Chinese Translation of the Buddhist *Tripitaka* that Caraka was the Court Physician of the Indo-Scythian King Kaniska, in the first century A.D.¹ But the following objections are to be met with before his conclusions can be accepted as proved :—

1. The age of Kaniska is not yet settled, the probable limits of his reign being from the first century B. C. to the second century A. D.² Moreover in the Buddhist *Tripitaka* referred to, the 'name' of Caraka is simply mentioned as the Court Physician of the King Kaniska but there is nothing to identify him with the author of the book. The same name, found in different places, does by no means signify the same person.

2. The time assigned to Caraka by the Indian medical tradition is of great antiquity. With regard to the chronological position of the three old authors, he is mentioned as anterior to Suśruta and Vāgbhaṭa I.³

3. Dr. Rāy has pointed out that the name Caraka is patronymic in the Veda.⁴ It is quite possible that a much

¹ See *Journal Asiatique*—July to December 1896, p. 444 to 484 and January to June 1897, p. 5 to 42; also *Indian Antiquary* Vol. XXXII, 1903, p. 382 and *Viena Oriental Journal*, Vol. XI., p. 164.

² See V. A. Smith's *Early History of India*, P. 225-26.

Dr. Fleet in *J. R. A. S.*, 1906, P. 979.

Dr. Bhandarkar in *J. R. A. S. (Bombay Branch)*, Vol. XX, P. 269.

J. A. S. B. Vol. XXXIX, 1870, p. 65 and 126.

³ चरकः सुश्रुतश्चैव वाग्भटश्च तथापरः ।
मुह्यन्तश्च संहिता वाच्यास्त्रिस्त एव युगे युगे ॥
अत्रिः कृतयुगे वैद्यी ह्यपरि सुश्रुती सतः ।
कलौ वाग्भटनामा च गरिमाच्च प्रदृश्यते ।

Hārta Saṁhitā, Pariśiṣṭadhāya.

⁴ Dr. P. C. Rāy's *History of Hindu Chemistry*, Introduction, P. X.

later namesake of his, is referred to by the *Tripitaka*, just as we know that more than one Vāgbhaṭa appeared as successful physician. Again we have evidence that eminent physicians in later times were called Caraka by way of a compliment and so Vāgbhaṭa was called Caraka of Sindh or Sindhicara.

4. Pāṇini wrote special Sūtras for the Agniveśas and the Carakas.¹ These names must have been famous before Pāṇini's time, otherwise he would not have written special Sūtras for them. Prof. Goldstucker has conclusively proved that Pāṇini could not have flourished later than the sixth century B. C.²

5. Patañjali wrote a commentary on Caraka.³ He flourished during the second century B. C. Both Cakrapāṇi-datta and Bhoja allude to him as the redactor of Caraka Saṁhitā.⁴ So Caraka must have flourished long before him, for unless his work was regarded as a standard work of authority, Patañjali would not have taken so much pains to write notes on the book, and still more for issuing a redaction.

6. The internal evidence of the book itself speaks against such an assumption. There is no salutation to any deity at the

¹ कटचरकाह्निक । Pāṇini 4. 3. 107.

गर्गादिभ्यो यच्च ॥ Ibid, 4. 1. 105.

वर्म । वत्स । * * * * अग्निर्विष्णु * * * * पराशर । ऋतुकर्म । * * * .

² Goldstucker's Pāṇini; and Journal of the Asiatic Society of Bengal, Vol. XLII, P. 234.

³ आग्नीमान् अन्नभवेन वस्तुतत्त्वस्य कान्तेन निश्चयवान्, वाग्गादिभ्यश्चादपि नास्त्वयावादी वः स इति चरके पतञ्जलिः ।

Quoted in Laghumañjara of Nāgeśa Bhaṭṭa (Rāy).

⁴ पातञ्जल—महाभाष्य—चरकप्रतिमंस्कृतैः ।

ममीवाक्-कायदीवावाक् इत्येवमपि पतञ्जलिः ॥

Hide salutation in the Āyurvedārthadipikā.

beginning of the book,—a custom invariably found to be observed in the more modern compilations. There is complete absence of Paurāṇic theology in the Caraka Saṁhitā, nor is there any reference to Śākya Muni and his religion. Kaṁiṣka was a great patron of Buddhism, and it might naturally be expected from the Court Physician of the king to describe the charitable hospitals which we know from the edict of Aśoka, to have flourished in every quarter of India. On the contrary we find descriptions of a hospital as reserved for rich men only at their own houses. Those gods and goddesses that figure so prominently in the Purāṇas were unknown during his time.¹ Beef was not then, apparently, a

¹ No doubt the names of Lakṣmī, Kṛṣṇa and Vāsudeva occur in Cikitsita Sthānam, Chapter XXV, but it should be remembered that they occur in the Supplement added by Dṛḍhavalā in later times.

सर्वं यद्वा न तत्र प्रभवन्ति न चाग्निश्चैव नृपचौराः ।

• लक्ष्मीश्च तत्र भजते यत्र महागन्धहृत्स्थितिः ॥

पितृमात्रं द्रुमश्चात्र सिद्धं सन्तमूदीरयेत् ।

मम माता जया नाम विजयी नाम मे पिता ॥

सीङ्गं जयी जयापुत्री विजयीऽथ जयामि च ।

नमः पुरुषसिंहाय विश्वे विश्वकर्माय ॥

सनातनाय कृष्णाय भवाय विभवाय च ।

• तेजो हवाकपेः साक्षात् तेजो ब्रह्मेन्द्रीर्यमे ॥

यथाहं नाभिजानामि वासुदेवपराजयम् ।

Caraka Saṁhitā, VI, xxv.

But Kṛṣṇa and Vāsudeva are mentioned in Pāṇini as demigods, having many adherents who formed a class. “वासुदेवाङ्गनाम्नां वुन” Pāṇini, 4. 3. 98. Again the passage may be an interpolation of a subsequent *Vaiṣṇava Vaid*.

So Bṛṣavadhva is also mentioned in Dṛḍhavalā's Supplement, as a god to be worshipped during the preparation of some medicines :

ब्रह्मघोषशङ्खपटहमेरीनिनादेः सिद्धं सितच्छत्रहस्तच्छायं • गजस्तम्बमारोपयेद्भगवन्तं
हृषभजमभिपूज्य तं खेहं विभागमार्चिर्ब्रह्मवायीः सुतिदेवता च नैव सिं गमयेत् ॥

Ibid, VIII, xii.

forbidden food, for it is spoken of as an article of diet that should not be indulged daily,¹ nor should it be used in excessive quantity as it is mentioned as a cause of the disease, Vāta-Rakta.²

The style of the book is antiquated and decidedly savours that of the Brāhmaṇas. Nāya and Vaiśeṣiki systems occur in the text,³ and so probably the book was written long before the compilation of these Sūtras.

Editions.—The book had undergone several editions. It was edited by Jibānanda Vidyāsāgar, Calcutta, in 1877 and 1896 (2nd Ed.) ; by Gaṅgādhar Kaviratna, Berhampur, 1879 ; by Gupta, Calcutta, 1897 ; with commentary by Cakrapāṇidatta, Calcutta, 1892-93 ; by Jaśodānandana Sarkār, with Bengali translation, 1894.

Translations.—It had been translated into English by A. C. Kaviratna, Calcutta, 1897. Caraka was translated from Sanskrit

And we find that the antidote to poison called महागन्धस्त्री is said to have been told by Tryambaka (Śiva) to Baiśravaṇa (Kuvora):

अगदीये वैश्रवणाख्यातन्यस्वकीयं घट्टकः ।

Caraka Saṁhitā, VI. xxv.

Also we find the name of Kārttikeya mentioned in Sec. IV. ch. viii.

प्रसूतं त्वमबिलिष्टमबिलिष्टा शुभानने,
कार्तिकेययुतिं पुत्रं कार्तिकेयाभिरक्षितमिति ॥

¹ कुर्विकांश्च किलाटांश्च शौकरं गन्धममिश्रं ।

मत्स्यान् दधि च भाषांश्च यावकांश्च न शौकयेत् ॥

² कुलत्थमाषनिष्पादशाकादिपल्लवुभिः ।

दधप्रारनालसर्वीरयुक्ततक्रसुरासवैः ॥

³ Vide Caraka, III. viii.



LB: 4: 7
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into Arabic in the beginning of the eighth century and his name "Sharaka Indianus" occurs in the Latin translations of Avicenna, Rhazes and Serapion. "A translation of the Karaka¹ from Sanskrit into Persian and from Persian into Arabic is mentioned in the Fihrist, (Finished 987. A.D.). It is likewise mentioned by Albērūnī²; the translation is said to have been made for the Barmekides."³ Albērūnī's chief source on Medicine was "Caraka, in the Arabic Edition of Ali Ibn Zain, from Trabaristan."⁴

Commentaries.—

1. Patañjali—2nd century B.C.—not available.
2. Cakrapāṇidatta's Caraka Tātparya Tīkā, or Āyurveda-dīpikā⁵—1060 A.D.
3. Haricandra⁶—1111 A.D.—not available.
4. Śībadāsa's Caraka-Tattva-Pradīpikā.
5. Gaṅgādhara's Jalpa-Kalpa-Taru—1879 A.D.

¹ Proceedings of the As. Soc., Bengal, 1870, September.

² Reinaud, *Memoire sur l'Inde*, P. 316.

³ Maxmuller's Science of Language, Vol. I., P. 168, Foot Note.

⁴ Sachau's preface to India, P. XL.

⁵ See Caraka Saṁhitā with Cakrapāṇidatta's Commentary by Kavirāja Harināth Viśārada, Calcutta, 1895.

⁶ A Commentary written by Haricandra is referred to in the Sanskrit Śloka narrating the geneology of Maheśvara, the author of Viśvaprakāśa and Sāhasāṅkacarita, who flourished during the reign of Sāhasāṅka, king of Gazipur in 1033 Saka (1111 A. D. Wilson).

श्रीसाहस्राक्षदुपलेखवद्विद्य-

वेद्योत्तरङ्ग पदपङ्क्तिमेव विभत् ।

यश्चन्द्रचारुचरितो हरिचन्द्रनामा

सद्वाख्यया चरकतत्त्वमलंकार ॥

into Arabic in the beginning of the eighth century and his name "Sharaka Indianus" occurs in the Latin translations of Avicenna, Rhazes and Serapion. "A translation of the Karaka¹ from Sanskrit into Persian and from Persian into Arabic is mentioned in the Fihrist, (Finished 987. A.D.). It is likewise mentioned by Albērūnī²; the translation is said to have been made for the Barmekides."³ Albērūnī's chief source on Medicine was "Caraka, in the Arabic Edition of Ali Ibn Zain, from Trabaristan."⁴

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¹ Proceedings of the As. Soc., Bengal, 1870, September.

² Reinaud, *Memoire sur l'Inde*, P. 316.

³ Maxmuller's Science of Language, Vol. I., P. 168, Foot Note.

⁴ Sachau's preface to India, P. XL.

⁵ See Caraka Saṁhitā with Cakrapānidatta's Commentary by Kavirāja Harināth Viśārada, Calcutta, 1895.

⁶ A Commentary written by Haricandra is referred to in the Sanskrit Śloka narrating the genealogy of Maheśvara, the author of Viśvaparakāśa and Sāhasāṅkacarita, who flourished during the reign of Sāhasāṅka, king of Gazipur in 1033 Saka (1111 A. D. Wilson).

असिहसाङ्कटपतेरणवद्यविय-

वैद्यीत्तरङ्ग पदपङ्क्तिमेव विभत् ।

यस्यन्द्रचारुचरितो हरिचन्द्रनामा

सद्ग्राह्यया चरकतत्त्वमलं चकार ॥

SUSRUTA SAMHITĀ.

The next treatise on Hindu Medicine is the *Suśruta Samhita*. *Suśruta* was the son of the sage *Viśvāmitra*,¹ a contemporary of *Rāma*. He learned the Science of Medicine from *Divodāsa*, surnamed *Dhanvantari*, king of Benares, at his Himalayan retreat. According to *Suśruta*, *Divodāsa* was the incarnation of *Dhanvantari*, the celebrated physician of the gods in heaven, and he first propounded the Art of Healing in this world.² *Suśruta* represented the Surgical School while *Caraka* was pre-eminently a Physician in practice.

As regards the authorship of the book, opinions differ. To *Suśruta*, *Dhanvantari* addressed his lectures on Major Surgery,³

¹ *Mahābhārata*, *Anuśāṣana Parva*, Ch. 139, Vs. 8-11.

धन्वन्तरिर्धर्म्यभृतां वरिष्ठी वाग्निशारदः ।

विश्वामित्रात्मजश्चिं शिष्यं सुश्रुतमख्यशात् ॥

Suśruta Samhita, V. ii.

अष्टाङ्गयज्वेदविदं दिवीदासं महामतिं ।

क्षिप्रशस्त्रार्थसन्देहं सूक्ष्मागधमिवोदधिं ।

विश्वामित्रसुतः श्रीमान् सुश्रुतः परिपृच्छति ।

Ibid, VI. lxvi.

सर्वशस्त्रार्थतत्त्वज्ञं क्षपीदृष्टिं रुदारधीः ।

वैश्वामित्रं शशसाय शिष्यं काशिपतिर्मुनिः ॥

Ibid, VI. xxviii.

² अथ खलु भगवन्तमरवरसृषिगणपरिहृतमाश्रमस्थं काशिराजं दिवीदासं धन्वन्तरि-
नोपध्वजवैतरणीरभपोक्तालावतकरवीर्यगोपुररचितसुश्रुतप्रभृतय ऊतुः ।

Ibid, I. i.

³ अथ कस्य किमुच्यतामिति । त ऊतुः । अस्माकं सर्वेषामेव शल्यज्ञानमूलं
क्षत्रीपदिशतु भगवानिति । स उवाचैवमस्मि । अस्माकमेकमतीनां मतमभिसमोदय
सुश्रुतो भगवन्तं प्रत्यति ।

Ibid, I. i.

which he reproduced in this work. But in the opening lines of the book, salutation is offered to Brahmā, Dakṣa, Aśvins, Indra, Dhanvantari, Suśruta and others.¹ This shows that Suśruta can not be the author of the work or at least of the work in its present shape, for no author can offer salutation to himself. By "the others" are no doubt meant the notable surgeons who practised and taught the Science of Surgery and who were either contemporary with or posterior to Suśruta. Possibly the original Suśruta Saṁhitā had been recast and the redactor could appropriately offer a salutation to the original author and to other surgeons who flourished before him. There is also an Indian medical tradition, noted in Dallanācārya's Commentary, which assigns the improved and supplemented edition of Suśruta's original work to Nāgārjūna,² the celebrated Buddhist Chemist, who is said to have been a contemporary of the king Śātvāhana.³

In the third chapter, Suśruta enumerates the subjects described by him,—the chapter forming an index of the book. Therein he mentions the five principal divisions of his book and says that the Uttara Tantra or the Supplement would be

¹ नमो ब्रह्मप्रजापत्यशिवबलमिह्वन्तरिसुश्रुतप्रदत्तिभ्यः ।

Suśruta Saṁhitā, I.

² यत् यत् परीक्षे नियोगस्तत्र तदेव प्रतिसंस्कारुं सूत्रं ज्ञातव्यमिति । प्रतिसंस्कारोपीड नागार्जुन एव ।

Dallanā's Commentary to Suśruta, I. i.

See also Dr. Cordier's *Recentes Decouvertes*, pp. 12-13.

* See *Harṣacarita* by Vāṇa.

Beal's *Buddhist Records of the Western World*, Vol II., P. 209, 212, 216.

Burgess' *Archaeological Survey of S. India*.

Introd. à l'histoire du Budh. Ind., P. 508.

described afterwards.¹ Now the fact that the sixth part was appended to the work as a Supplement or Uttara Tantra (i.e., after treatise) clearly shows that it was written afterwards by another surgeon and added to the original treatise. If the original Susruta wished to have six divisions of his book, he would have mentioned it clearly in the index and would not have, after stating that his book consisted of five parts, added that "the Supplement would be described afterwards,"² which seems to be an interpolation of the Supplementor to pass his edition as the original work of the author. Again at the end of the fifth section, there is a passage describing the importance of the Āyurveda, which was meant as the conclusion of the book by the author.³ It is to be noted

¹ प्रागभिहितं सविंशमध्यायशतं पञ्चसु स्थानेषु । तत्र सूत्रस्थानमध्यायाः षट्चत्वारिंशत् । षोडश निदानानि । दश शरीराणि । चत्वारिंशच्चिकित्सितानि । अष्टौ कल्पाः । तदुत्तरं षट्षष्टिः ।

अध्यायानां शतं विंशमेवमेतदुदीरितम् ।

अतः परं स्वभावेनैव तन्त्रमुत्तरमुच्यते ॥

Susruta Samhitā, I. iii.

² बीजं चिकित्सितमैतत् समासेन प्रकीर्तितम् ।

सविंशमध्यायशतमस्य व्याख्या भविष्यति ॥

तच्च सविंशमध्यायशतं पञ्चसु स्थानेषु । तत्र सूत्रस्थाननिदानशरीरचिकित्सितकल्पे-
र्धर्मवशात् संविभज्योत्तरे तन्त्रे शेषानर्थान् व्याख्यायास्यामः ।

Ibid, I. i.

³ सविंशमध्यायशतमेतदुक्तं विभागशः ।

इहोद्दिष्टाननिर्दिष्टान्सर्वान् वक्ष्याम्यथोत्तरे ॥

सनातनत्वाद्देवानामचरत्वात्तथैव च ॥

तथा दृष्टफलत्वाच्च हितत्वादपि देहिनां ।

वाक्समूहार्थविस्तारात् पूजितत्वाच्च देहिभिः ॥

चिकित्सितात्पुण्यतमं न किञ्चिदपि सुश्रुतम् ।

ऋषेर्निन्द्रप्रभावस्यारुह्यतयीनेर्भिषग्गुरोः ॥

धारयित्वा तु विमलं मतम् परमसम्मतम् ।

उक्ताहार समाचारैर्ह प्रेत्य च नोदते ॥

Ibid, V. viii.

that at the end of no other sections do we find a similar passage. He also writes: "Thus one hundred and twenty chapters are described" but adds: "The other diseases shall be described in the Uttara Tantra": the latter part no doubt is an interpolation of the Supplementor. Moreover, in the opening lines which serve as a preface to the sixth part, the authority quoted for the diseases of the eye is Nimi, the king Janaka of Mithilā and not Dhanvantari.¹ But in the first chapter of the first section, it is described that the sages wanted Dhanvantari to teach them Śalyatantra or Major Surgery only and he consented to their request. And this subject he treated in detail in the five sections of the book. In the Supplement, on the other hand, are described the other branches of the science such as Minor Surgery, Inner Medicine, &c. Probably this part was added afterwards to give completeness to the treatise; and the original Suśruta was called Vṛddhya or the Old by the commentators to distinguish him from the Supplementor.

Suśruta's work is specially important to us as having two whole chapters (vii and viii of Section I.) devoted to the descriptions of Surgical Instruments and one whole chapter (xxv of Section I.) to the principles of Surgical Operations.

The age of Suśruta is also involved in obscurity. Nothing can be ascertained from the fact that he was a son of Viśvāmitra²,

¹ अथ्यायानां श्रुते विशे यदुक्तमसङ्गमया ।
वक्ष्यामि बहुधा सव्ययुक्तैर्द्वयानिमित्ति ॥
इदानीन्तं प्रवक्ष्यामि तन्ममुत्तरमुत्तमं ।
निखिलेनीपदिश्यन्ते यत्र रोगाः पृथग्विधाः ॥
ब्राह्मणशास्त्राभिहितं विदेहाधिपकौशिताः ॥

Suśruta Saṁhitā, VI. i.

² Viśvāmitra is the gotra name; so the simple name may either refer to the great Viśvāmitra or to his descendants.

for the age in which the latter lived is not known to us. But he must have flourished during the Vedic Age as many Vedic Hymns are ascribed to him. In the *Mahābhārata*, *Suśruta* is mentioned as one of the sons of *Viśvāmitra*¹ and in the *Suśruta Saṁhitā* the author is often described as his son. The age of the great epic has, with good reasons, been fixed at 1000 B.C. So *Suśruta* must have flourished much earlier. The latest limit which we can assign to *Suśruta* is 600 B.C.* as "there are indications in the *Śatapatha Brāhmaṇa*, a secondary Vedic work, that the author of it was acquainted with the doctrines of *Suśruta*" as regards the Osteology. "The exact date of that work is not known, but it is with good reason referred to the sixth century B.C." Again in the *Atharva Veda*, in the tenth book, there is a hymn on the creation of man in which the skeleton is described according to *Ātreya* and *Suśruta*.² "The large portion of it (Books I to XVIII) indeed admittedly belongs to a much earlier period, possibly as early as about 1000 B.C.; and the hymn in question is included in this older portion"³. This shows that *Suśruta* could not have flourished later than 1000 B.C.

Again in *Hastī-Āyurveda*, a book on the Treatment of

¹ श्रामायनींश्च गार्ग्यंश्च जाबलिसुश्रुतसंस्था—

* * * * *

विश्वामित्रात्मजाः सर्वे सुश्रुतं ब्रह्मवादिनः ॥

Mahābhārata, *Anuśāṣana Parva*, Ch. IV.

² See J. R. A. S., 1906, P. 915; 1907, P. 1.

³ Hoernle's *Studies in the Medicine of Ancient India*, Part I. Osteology, Introduction, P. 9.

Elephants by Palakāpya, we find the Surgical instruments described after the manner of Suśruta. Palakāpya lived as a Veterinary Surgeon in the Court of Romapāda, King of Aṅga, which had as its capital the famous town of Campā, identified with the modern town of Bhāgalpur. King Romapāda was contemporary with king Daśaratha, the father of Rāma, the hero of Rāmāyana.¹ Here we have a corroborative evidence of the age of Suśruta.

Suśruta is mentioned in the *Vārttikas* of Kātyāyana² who flourished during the fourth century B.C.

We have alluded to Nāgārjūna,³ the Buddhist Chemist, as the redactor of the Suśruta Saṁhitā. He is said to have been a contemporary of king Kaṁṣka that is about the first century B.C.

Another revision was undertaken by Candrāṭe, the son of Tisāṭa, the author of Cikitsā-kalikā. He revised the text which must have fallen then into a state of corruption. The probable date of Candrāṭe is the ninth century A.D.⁴

¹ अग्निं यदुषमायसा पितरं च यश्चिन्म ।

एतन्निखेवकाले तु रोमपाद प्रतापवान् ।

Rāmāyana, Valakāṇḍam, Ch. IX.

See also Rāmāyana, i, 11, 13-20 ; Mahābhārat, iii, 110, 10008-9 ; Bhāgavat, ix, 23, 7-10.

² सुश्रुतेन प्रोक्तं सौश्रुत ।

³ Possibly more than one Nāgārjūna appeared in ancient India as a chemist. Albēruṇī says : "He lived nearly a hundred years before our time" (India, I. P. 189). Rājtarāṅgiṇī places him in the 3rd century B.C. (I. Vs. 172-173). The modern scholars are of opinion that the founder of the Mahāyāna system lived in the first century A.D.

⁴ Hoernle's Osteology, p. 100.

There is no doubt of the tradition that Suśruta's work was redacted, for the author could not write such a passage as follows: "The surgical treatises of Aupadhenava, Aurabhra, Suśruta and Pouṣkalāvata from the basis of other treatises on the subject."¹

*Commentators.*²—

1. Cakrapāṇidatta—Vānumati—1060 A.D.
2. Gayadāsa—{Nyāya Candrikā
or Pañjikā }—11th century A.D.
3. Jejjācāryya.
4. Bhāskara.
5. Mādhava.
6. Brāmhadeva.
7. Dallanācāryya—Nibandha Saṁgraha—12th century A.D.
8. Ubhalta (Kashmir).

Editions.—Suśruta Saṁhitā has been edited by Madhusūdan Gupta, Calcutta, 1835; by J. Vidyāsāgar, 3rd Edition, Calcutta, 1889; by A. C. Kaviratna, Calcutta, 1888-95; by Prubhurām Jibānarām, Bombay, 1901; and by Virasvāmī, Madras.

This book has been translated into English in part only by U. C. Datta 1883, A. Chatṭopādhyāy 1891, Hoernle 1897, Calcutta, in the Bibliotheca Indica. It has been translated into Latin by Hessler and into German by Vullurs.

The book was translated into Arabic before the end of the eighth century A.D. It is called "Kitāb-Shawshoon-al-Hindi"

1

अपिपेनवनीरभं सौश्रुतं पीप्पलावतम् ।

शेषाणां शल्यतन्त्राणां भूलाग्न्येतानि निर्दिशेत् ॥

Suśruta Saṁhitā, I. iv.

2

* * * * * श्रीसहजपालदेवदत्तपतिवल्गुभः श्रीडहणः समभूत् । तेन श्रीजैज्भट्ट टीकाकारः श्रीगयदासभास्करौ च पञ्जिकाकारौ श्रीमाधववल्गु-देवादीन् टीपनकारादीपजीव्यायुर्वेदशास्त्रं सुश्रुतव्याख्यानं निबन्धसंग्रहः क्रियते ।

Dallanā's Commentary, I. i.

and also mentioned as "Kitab-i-Susrud" or Book Suśruta by Ibn Abillsaibial. Rhazes often quotes Sarad as an authority in Surgery.¹

VĀGBHATA I.

The next author of celebrity and whose work is still extant is Vāgbhaṭa I or Vāgbhaṭa the elder, the author of Aṣṭāṅga Saṁgraha (*i.e.*, Compilation of the Octopartite Science). In later times, a namesake of his, wrote another work called Aṣṭāṅga Hṛdaya Saṁhitā (or the best Compendium *i.e.*, the Heart of the Octopartite Science). In the Uttara Sthāna, Vāgbhaṭa the younger distinctly states that his Compendium is based on the Compilation of Vāgbhaṭa the elder.²

As regards the age of Vāgbhaṭa the elder, there is the same uncertainty as with his predecessors. We are however sure that he is posterior to Caraka and Suśruta for he refers to these writers by name.³

The chronological relation of the three early authors is described in a popular couplet that Ātreya, Suśruta and Vāgbhaṭa were the three great medical authors for the three Yugas—

¹ "His next description is from an author named Sarad, whom he frequently quotes in other parts of his works".

Adam's Commentary on Paulus Æginetta, VI. lxi.

² अष्टाङ्गवैद्यकमहीदधिमन्यनेन योऽष्टाङ्गसंग्रहमहासुतराशिराज ।

तस्मादनल्पफलमल्पसमुद्यमाणां प्रीतयमेतदुदितं पृथगेव तन्मम् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, Uttara Sthāna, Ch. XI, v. 82.

³ By name, *e.g.* in Saṁgraha, Bombay ed., Vol. I, P. 246; Vol. II, P. 421. Again quoted from Caraka, *Ibid.*, Vol. I, pp. 20, 93; Vol. II, pp. 212, 213, *et passim*; from Suśruta I, *ibid.*, Vol. I, pp. 109, 121, 177, 247; Vol. II, p. 343, *et passim*. (Hoernle).

the Tretā, Dvāpara and Kali, respectively.¹ They are known as the Vṛddha Trayī or the Old Triad. This medical tradition goes much against the conclusion of Dr. Hoernle that Vāgbhaṭa I must have flourished early in the seventh century A.D. One of the reasons put forward by him is the fact, that "the Buddhist pilgrim I'Tsing, who resided ten years in the Nalanda University (in Bihar) from about 675-686 A.D., states in *Records of Buddhist practices* that the eight arts (*i.e.*, the branches of medicine) formerly existed in eight books but lately a man epitomised them and made them on one bundle (or book)."² Professor Jolly understands by it the Suśruta Saṁhitā while Dr. Hoernle points out with more reasons that it refers to Vāgbhaṭa I's work, the Aṣṭāṅga Saṁgraha (*i.e.*, the Compilation of the Octopartite Science) and rules out Suśruta by the word "lately."³ But the description that I'Tsing gives of the contents of the book does not warrant any reference to either. Moreover, he has not given any reason why Vāgbhaṭa II's book Aṣṭāṅga Hṛdaya Saṁhitā (the best Compendium of the Octopartite Science) might not be alluded to by I'Tsing. Dr. Hoernle, however, rules him out by date for "he can not be placed earlier than the eighth century"—an assertion unsupported by any evidence whatsoever. All that he has proved is that "Accordingly it is probable that all these three medical writers (Mādhava, Dṛḍhakaḷa and Vāgbhaṭa II) come in the period from the 7th to the

¹ See foot-note 3, P. 6.

² I'Tsing: *Records of the Buddhist Religion*. Transl. by Professor Takakusu, P. 128.

³ J. R. A. S., 1907, P. 413.

Hoernle's Osteology, Introduction, P. 10—11.

7th century A.D.¹ at no very great interval from one another," and this proof is based on the age of Vāgbhaṭa I as suggested by I'Tsing's remarks. Thus he has taken for granted what he is required to prove. He has shown that Suśruta is anterior to Vāgbhaṭa I; and Vāgbhaṭa II is posterior to him. But in trying to prove that Vāgbhaṭa I lived in the seventh century he cannot assume that Vāgbhaṭa II lived in the eighth. Another evidence adduced in support of his conclusion is the fact that the non-medical version of the list of bones of the human body as contained in the Law-book of Yājñavalkya presupposes earlier uncorrupted forms of lists of bones both in Caraka and Suśruta, and "the corrupt recension, traditionally handed down, must have come into existence at a later date," that is to say, between the date of Yājñavalkya (350 A.D.) and Vāgbhaṭa I, the latter of whom is proved to have copied from the corrupt recensions of Caraka and Suśruta. Thus the older recensions still existed in the fourth century A.D. and if we add to it the interval of time necessary for the texts to have fallen into a state of corruption, we get the early seventh century A.D. for Vāgbhaṭa I. But we must remember that there is nothing to prevent against the supposition that Vāgbhaṭa I lived before Yājñavalkya. There might have been two recensions of the texts available during Yājñavalkya's time, one corrupted and it might or might not have been the work of Vāgbhaṭa I and another true version which was availed of by the sage Yājñavalkya. And similar events have happened, as has been pointed out by Dr. Hoernle himself, in our own generation. Gaṅgādhara's recension of Caraka is a corrupted form of the text,

¹ *Ibid*, P. 16.

while the recension given in Jībānanda's edition is the traditional text of Caraka. No critic would I think jump into the conclusion that Gaṅgādhar lived three or four centuries after Jībānanda. • Again if it be true, as he contends, that Suśruta was redacted by Vāgbhaṭa I, we could easily imagine that Yājñavalkya copied his list bones from the original Suśruta and not from the redaction of Vāgbhaṭa I. So we see that the age assigned to Vāgbhaṭa I, or the seventh century A.D. can not be accepted as proved. Dr. Hoernle says : "It should, however, be understood that these conclusions regarding the date and authorship of Vāgbhaṭa I, are not put forward as established fact."

Let us recapitulate the objections that can be urged against the conclusion that Vāgbhaṭa I lived in the seventh century A.D.

1. Vāgbhaṭa I is believed by the Indian medical men to have flourished long before the Christian era. By some, he is connected with the court of Yudhiṣṭhira, but his name is nowhere mentioned in the Mahābhārata. Ātreya, Suśruta and Vāgbhaṭa are described as the Old Triad or Vṛddhya Trayī and they were the authorities for the Tretā, Dvāpara and Kālī Yugas, respectively. It is curious to observe that Dr. Hoernle, in arguing against the conclusion of Prof. Jolly that Suśruta is meant by I'Tsing, takes advantage of this Indian medical tradition that Suśruta flourished during pre-historic times, but does not mention the same tradition with regard to Vāgbhaṭa I, which goes against his own conclusion. On the other hand the same objection does not apply against Vāgbhaṭa II.

2. The name of Vāgbhaṭa. I's book, Compendium of the

Octopartrite Science, no doubt, agrees very well with the description of I'Tsing that "lately a man collected them into one bundle." But Vāgbhaṭa II's book "The best Compendium of the Octopartrite Science" is equally suggestive, though Dr. Hoernle says: "it cannot prevail by the side of the more suggestive name of the rival work of Vāgbhaṭa the elder."

3. Again in arguing against Prof. Jolly, Dr. Hoernle has attached much importance to the word "lately" by which Suśruta is ruled out by date. Admitting the validity of such reasoning, it does not follow that by the word "lately" I'Tsing meant any contemporary author or any one who preceded him by a short period only. To comprehend the meaning of the sentence we must understand the word "lately" in connection with the word "formerly" used before.¹ Now the sentence "The science of medicine formerly existed in eight books" no doubt refers to the division of Āyurveda into eight parts by Brahmā and to the treatises on the different branches of Medicine by Agniveśa, Suśruta and others. These treatises are believed to be of remote antiquity, and so any later compilation may be spoken of as recent in comparison with the old treatises of unknown ages. Thus the word "lately" may refer either to Vāgbhaṭa I or Vāgbhaṭa II, but the latter author's claim to the honour becomes reasonable considering his decided posteriority to the former and so coming within the limit of the time suggested by the word "lately."

4. Again I'Tsing refers to a book which was recognised as the standard throughout India. This may refer either to

¹ J. R. A. S. 1907. P. 174.

Vāgbhaṭa I or II. But if Vāgbhaṭa I's book occupied such a position at the time of I'Tsing, it becomes difficult to imagine why Vāgbhaṭa II should write another work principally based on the work of Vāgbhaṭa I after a lapse of a century or so. Moreover, we find at the present time, that Vāgbhaṭa II's book, *Aṣṭāṅga Hṛdaya Saṁhitā*, has a wider popularity than the book *Aṣṭāṅga Saṁgraha* of Vāgbhaṭa I. The former has been printed many times and is widely read by the students,—so much so Vāgbhaṭa is generally known as the author of *Aṣṭāṅga Hṛdaya Saṁhitā*.

5. Moreover, the Arabian physician Rhazes, who is said to have lived in the ninth century (882 A.D.) in treating of the property of ginger, the common plantain or musa and other drugs, quotes from an Indian writer, whom he calls Sindaxar or Sindicara.¹ Royle says: "But in the article *De Allio* another Indian author is quoted, whom I have not been able yet to trace out—*Ait Sindifar* (in another place written "*Dixit sindichar*") *indianus* valet contra Ventositatem." This Sindicara is identified with Vāgbhaṭa II of Sindh who was in his time known as a second Caraka or Cara, the syllable "ka" making no difference, as in words like "bāla" and "bālaka," both meaning a child.² We know that the Vāgbhaṭa's *Aṣṭāṅga Hṛdaya Saṁhitā* was one of the medical works translated by the order of Caliphs in the eighth century.³

6. The translations of the Caraka, the Suśruta and the Vāgbhaṭa occur in the Thibetan Tanjur.⁴ "George Huth,"⁵

¹ Antiquity of Hindu Medicine, Page 38.

² History of Aryan Medical Science, P. 196.

³ Zeit. deut. morg. Ges. 34, p. 465.

⁴ Jour. Asiatic Soc. XXXVIII. (1835).

⁵ Zeit. deut. morg. Ges. T. (LXIX. pp. 279—284).

who has recently critically examined the contents of the Tanjur, concludes that the most recent date at which it can be placed is the 8th century A.D.”¹

So I cannot avoid the conclusion that of the three authors, Suśruta, Vāgbhaṭa I and II, to which I'Tsing's remarks may refer, the last has probably the best claims to that reference; and the date assigned to Vāgbhaṭa I may well suit Vāgbhaṭa II i.e., “as late as the early 7th century A.D.”² and possibly still earlier.³ Again it is impossible for us to say whether I'Tsing's remarks may not appropriately refer to other authors whose works are lost to us.

Mention should also be made of the fact pointed out by Dr. Cordier that Vāgbhaṭa is mentioned in Rājtarāṅgiṇī and his date is fixed there as 1196-1218 A.D.⁴

But the name of Vāgbhaṭa does not occur in Stein's edition of Rāj, which is no doubt the most reliable, and so we can easily dismiss this view as untenable.

Editions.—Vāgbhaṭa I's book *Aṣṭāṅga Saṁgraha* has been printed in Bombay.

Commentary.—Arunadatta—about 1220 A.D.

¹ P. C. Rāy's History of Hindu Chemistry, Intro., P. XXIX.

² Hoernle's Osteology, Intro., p. 10.

³ Dr. Kunte places him “at least as early as the second century before Christ,” Vide his Intro. to Vāgbhaṭa's *Aṣṭāṅga Hrdaya Saṁhitā*.

⁴ सिंहगुप्तसुतः परमवैद्वी वाग्भट्टाचार्यः काश्मीरनगरपति जयसिंहस्य प्रजापालन समये (खः बादशह जहाङ्गीर, शक १११८—४०) वर्तमाना कासीत् ।

Quoted in Cordier's Vāgbhaṭa et L'*Aṣṭāṅga Hrdaya Saṁhitā*, 1896.

See Intro. to the Vaidyākṣabdasindhu by Kavirāja Umeścandra Gupta, 1894.

VĀGBHATA II.

The next great authority in Hindu medicine is Vāgbhaṭa II, son of Simha Gupta, an inhabitant of Sindh.¹ His work, *Aṣṭāṅga Hṛdaya Samhitā*, the author himself states, is based on the summary of Vāgbhaṭa the elder.² In the first chapter of *Sūtra Sthāna*, he acknowledges the help he received from the works of Agniveśa, Hārīta, Bhela, and others.³ The fact that Caraka is not referred to here as one of the sources of Vāgbhaṭa II has been taken advantage of by some to prove the posteriority of Caraka.⁴ They conclude that Agniveśa and Suśruta wrote their works long before him, and the Agniveśa Tantra was not called by the name of, and in fact was not as yet edited by, Caraka, at the

- 1 भिषग्बरी वामट इत्यमुने
पितामही नामधरीऽभि यस्य
सुतीऽभवत्तस्य च सिंहगुप्तः
तस्याप्यहम् सिन्धुसु जातजन्मा ॥

Aṣṭāṅga.

- 2 *Aṣṭāṅga Hṛdaya Samhitā*, Uttara Sthāna, Ch. XL, v. 82.
See foot note 2, p. 18.

- 3 ब्रह्मा सधत्वाऽऽयुषी वेदं प्रजापतिमजियद्वत् ।
सीऽश्विनौ तौ सहस्राक्षं सीऽचिपुत्रादिकान्मुनीन् ॥३॥
तेऽग्निवेशादिकस्ते तु पृथक् वन्नापि तेनरे ।
तेभ्योऽतिविप्रकौर्षेभ्यः प्रायः सारतरीचयः ।
क्रियतेऽष्टाङ्गद्वयं नातिसंक्षेपविस्तरम् ॥५॥

Aṣṭāṅga Hṛdaya, *Sūtra Sthāna*, Ch. I.

- 4 "It would appear also that at the time Vāgbhaṭa lived, Agniveśa's work was not called by the name of Caraka, and Suśruta had also been written. Hence it follows that Caraka's edition of Agniveśa, that is the work now called Caraka, was probably edited after Suśruta had been written."

Dutt's *Materia Medica of the Hindus*, Intro., p. IX.

time Vāgbhaṭa II flourished. The argument is however not conclusive; it only shows that the Agniveśa Tantra was available to Vāgbhaṭa II in its original form. No definite results can be expected from this *argumentum ex silentio*. Again it may easily be imagined, and I think it is the right view of the question, that Caraka lived and edited Agniveśa's work long before Vāgbhaṭa, the reason of Caraka being not mentioned in Vāgbhaṭa's book, is the fact that Caraka did not usurp the authorship of Agniveśa Tantra but clearly states at the end of each chapter the real nature of his share in the authorship of his book in the following words:—"Here ends the chapter of Agniveśa Tantra as corrected and edited by Caraka." Many modern text books of medicine have been edited and improved, though the books are still called after the original authors. Moreover to make Caraka flourish after Vāgbhaṭa II would bring him to quite modern times.

We are however arguing on false premises. Though Caraka is not mentioned in the Sūtra Sthāna of Aṣṭāṅga Hrdaya, his name occurs in the Uttara Sthāna.¹ So there can be no doubt that Caraka's edition of Agniveśa was current in India long before Vāgbhaṭa II wrote his Aṣṭāṅga Hrdaya Saṁhita.

¹ यदि चरकमधीते तदधुवं सुश्रुतादि

प्रणिगदितगदानां नाममात्रेऽपि वाच्यः ।

अथ चरकविहीनः प्रक्रियायामखिन्नः

किमिह खलु करीतु व्यधितानां वराकः ॥४२॥

* * *

ऋषिप्रणीते प्रीतिश्चेन्मुक्ता चरकसुश्रुतौ ।

भेदायाः किं न पठ्यान्ते तस्माद्वाच्यं सुभाषितम् ॥४३॥

Aṣṭāṅga Hrdaya Saṁhita, (Ed. Vijayratna Sen),
Uttara Sthāna, Ch. XL

Editions.—There are various editions of the book but the following are reliable :—

1. By Dr. Anna Moreśvara Kunte, M.D., 2 vols., Bombay, 1880; 2nd Ed., 1891.
2. By Jibānanda Vidyāsāgara, Calcutta, 1882.
3. By Vijayratna Sen Kaviranjana, Calcutta, 1885-90.
4. By Ganeś Sastri Tartevoidya, Bombay, 1888.
5. In Sanskrit and Bengali, with the commentary of Arūṇadatta by Vijayratna Sen Gupta, Calcutta, 1888.
6. In Sanskrit and Guzrathi by Behicharlal Nathuram, Ahmedabad, 1889.
7. In Sanskrit and Bengali by Kālīśa Cundra Sen Gupta, Calcutta, 1890-1892.
8. In Sanskrit and Hindi by Pandit Robi Dutta, Bombay, 1890.
9. In Sanskrit and Marathi by Ganeś Kṛṣṇa Garde, Poona, 1891.
10. In Sanskrit and Bengali by *Kavirāja* Binod Lāl Sen, Calcutta, 1891-1892.

*Commentaries.*¹—

1. Sarvāṅga-Sundarī² by Arūṇadatta, son of Mṛgāṅka-datta, 1220 A.D.

¹ See Cordier's *Vāgbhaṭa et L'Aṣṭāṅgahrdaya Saṁhitā*, P. 6.

² इति श्रीमृगाङ्गदत्तपुत्र श्रीमदङ्गदत्तविरचितायां
सर्वङ्गसुन्दराख्यटीकायां * * * *

2. Āyurvedadarśayana (Dinacharyā Prakarana) by Hemadri or Kamadeva, Raja of Devagiri. It is available in parts only.
3. Aṣṭāṅgahrdayarddyota by Aśadhara Saṁlaxana.
4. Padārthacandrikā by Candracandana.
5. Saṁketamañjarī by Dāmodara.
6. Aṣṭāṅga Hrdayatikā by Rāmanāth Vaidya.
7. Vālaprobodhikā (Anonymous).
8. Hrdayabodhikā „
9. Pāṭhya.
10. Vāgbhaṭartha Kaumudī by Hari Kṛṣṇa Sen Mullick.
11. Pradīpa by Jaśodānandan Sarkār, 1298 B.S.

VĀGBHATA III.

The author of Rasaratna Samuccaya in the Colophons at the end of each chapter identifies himself with Vāgbhaṭa II: "Here ends Book first (or so) of R.R.S. composed by Vāgbhaṭa, son of Simha Gupta, prince of physician." The salutation at the beginning of his book is strictly Buddhistic. The probable date of the book is "placed between the thirteenth and fourteenth centuries A.D."¹ "The chemical knowledge, as revealed in Vāgbhaṭa is almost on a par with that in the Suśruta," whereas the R. R. S. indicates an advanced state of that science. He quotes Rasārṇava as a source of his information; he does not mention opium as a medicine, and the Firaṅga roga and its treatment find no place in his book.

¹ P. C. Rāy's History of Hindu Chemistry, Intro., p. li.

MĀDHAVAKARA.

He is the author of the famous work on Pathology or Nidāna. His book was translated into Arabic by the order of Harun-Al-Rasid and so the most recent date that can be assigned to him is the seventh century A.D.¹ Thakore Saheb of Gondal identifies him with Mādhavācāryya, the celebrated author of Sarvadarśana Saṁgraha, the brother of Śāyana, the commentator of the Vedas.² I do not find any authority for such an assertion and here is an example of fallacious reasoning based simply on the identity of names. Mādhavācāryya and Śāyana lived in the twelfth century A.D. Mention should also be made of the view expressed by Dr. Hoernle as certain that Mādhavakara, the author of Nidāna and Vṛnda Mādhava, the author of Siddhayoga are one and the same person. He holds that Vṛnda is the real name, but he was known to the commentators as Mādhava; for his melodious diction. There is no proof given of this opinion, and we have reasons for not accepting it. However as he does not treat of surgical instruments, his work is not important to us.

CAKRAPĀNIDATTA.

Cakrapānidatta or more commonly Cakradatta in a Colophon³ has given an account of himself in his book called

¹ Jolly's Indian Medicine, ff 5, 6, pp. 7-9.

² History of Aryan Medical Science, Ch. II, p. 35.

³ गौड़ाधिनाथ रसवत्याधिकारिपाच—

नारायणस्य तनयः सुनयीन्तरङ्गात् ।

भानीरनु प्रथितलोघवलीकुलीनः

श्रीचक्रपाणिनिह कर्तृ पदाधिकारी ॥

Colophon in Cakradatta,

Cikitsā Sāra Saṁgraha: "The author of this work is Śrī Cakrapāṇi who belongs to the family of Lodhravali; and who is the youngest brother of Vānu and the son of Nārāyaṇa, the superintendent of the kitchen of Nayapāla,¹ the king of Gour." This book is arranged on the plan of Vṛnda in his Siddhayoga² which again follows closely as a companion volume to Mādhava's Nidāna.³ The age of Cakradatta is about 1060 A.D.; and Vṛnda must have flourished between Mādhava and Cakrapāṇi for he quotes the former while he is himself quoted by the latter. So the probable age of Vṛnda is the ninth century A.D. Besides being a celebrated author, Cakradatta wrote excellent commentaries of Caraka and Suśruta. His extant works are—

1. Cikitsā Sāra Saṁgraha or Cakradatta. A treatise on Medicine.

¹ For the date of Nayapāla, vide Cunningham's Archæo. Survey of India. III. P. 119; also J. A. S. LX. Pt. I. P. 46. Life of Atisa by S. C. Dās.

² यः सिद्धयोगलिखिताधिकसिद्धयोगा—
नतैव निक्षिपति केवलमुद्धरेत् ।
भङ्गचयत्रिपथवेदविदा जनेन
दत्तः पतेत् सपदि मूर्ध्नि तस्य शपः ॥

Sloka at the end of the Cakradatta.

य इत्यादी—सिद्धयोग इति वन्द्यतसंयहस्य संज्ञा, तल्लिखितयोगसमेत्याधिका ये च सिद्धयोगा अत्र संयहे चक्षास्तानधिकयोगान् तत्रैव सिद्धयोगे निक्षिपति, तथा यी वा तानधिकसिद्धयोगानितः संयहादुद्धरेत् दूरीकुश्यात्, तस्य मूर्ध्नि ईदृशेन पुंसा दत्तः शपः पतेत् । कीदृशेन पुंसा ? भङ्गचयत्रिपथवेदविद्या । कारिका वृद्धीका चन्द्रटीकेति भङ्गचय, त्रिपथवेदः ऋग्यजुःसामऋषः, तद्विदा ॥

Śibadāsa Sen's Commentary.

³ वन्देन * * * * * संलिख्यते गदविनिश्चयक्रमेण ॥

Vṛnda's Siddhayoga.

2. *Cakradatta* or *Materia Medica*. It treats on drugs applicable to a number of diseases.
3. *Muktābali*. This treatise on the nature and properties of medicinal drugs is ascribed to *Cakrapāṇi*.
4. *Vāṇīmātī*—Commentary on *Suśruta Saṁhitā*.
5. *Cakratattwadīpikā*—Commentary on *Caraka Saṁhitā*.

Editions.—

1. *Cakradatta* or *Cikitsā Sāra Saṁgraha* edited by *Kaśī-rāja* Pyāri Mohan Sen Gupta, Calcutta, 1295 B.S.
2. *Cakradatta* with Bengali translation by *Candrakumār* Dās Kavibhūṣan.
3. *Cakradatta* with Bengali translation and with commentary of *Śiva Dās* Sen, by *Jasodā* Nandan Sarkār, 1302 B.S.

SĀRĀNGADHARA.

He wrote *Sāraṅgadhara Saṁgraha*. It is compiled from the works of *Caraka*, *Suśruta*, *Vāgbhaṭa* and others.¹ It is very popular in Western India. It treats on nosology and practice of Medicine. He was the son of *Dāmodara* and flourished in the fifteenth century A.D.

Edition.—By *Kaśī-rāja* Pyāri Mohan Sen Gupta, Calcutta, 1296 B.S.

¹ बभ्रवर्षीया मुनिभिः प्रयुक्ता
 द्विकल्पके चैव चर्चोऽनुमताः ।
 विधीयते यत्र चैव सेवा
 कुर्वन्तः यत्नमरक्षणम् ॥

Commentary.—Sāraṅgadharatikā: It is a commentary on the above work by Adhamulla.

BHĀVA MIŚRA.

About 350 years ago, a compilation was made by Bhāva Miśra, son of Lataka Miśra, an inhabitant of Benares, from the most celebrated medical works and was called Bhāva Prakāśa.¹ He lived about 1550 A.D. and was considered a "Jewel of Physicians and Master of Śāstras." He mentions China root called Tob Chini² in the Vernacular as a remedy of Firaṅga roga or Syphilis³ which he describes for the first time in India. He was the first to make mention of certain drugs of foreign countries as Badhkshani Naspasi,

- ¹ आयुर्वेदास्मिन्धादतिमतिमुनयो योगरत्नानि यद्वा-
 ज्ञान्वा स्वे स्वे निवन्धेदधुरखिलजन व्यधिर्विभ्रंसनाय ।
 तत्तद ग्रन्थाद्व्युद्गीतैः सुवचनमणिभिर्भावमिश्रशिक्षित्वा
 शास्त्रे जाड्यान्धकारं प्रशमयितुमिमं सन्निधत्ते प्रकाशम् ॥

Bhāva Prakāśa, I. i.

इति श्रीमिश्र लटकतनय श्रीमन्मिश्रभावविरचिते
 भावप्रकाशे षष्ठ प्रकरणं सम्पूर्णं ॥

Colophon at the end of Section I.

- ² चीपान्तरवचा किञ्चित्तिक्तीणा बर्द्धीतिष्ठत् ।
 विवन्धाभानशूलघ्नी शूलन्मूत्रविशीघिनी ॥
 वातव्याधीनपक्कारमुन्मादं तनुवेदनम् ।
 व्यपीडति विशेषेण फिरङ्गामयनाशिनी ॥

Bhāva Prakāśa, I. i.

- ³ फिरङ्गसंज्ञके देशे बाहुल्येन व धञ्जैव ।
 तस्मात् फिरङ्ग इत्युक्ती व्याधिर्याधिधिगारदैः ॥

Bhāva Prakāśa, II. iv.

Khorasani and Parasika Vacha (Acorus Calamus), Sulemani Kharjura (date fruit of Suleman),¹ and opium.

Editions.—

1. By Jibānanda Vidyāsāgara, Calcutta, 1875.
2. By Rasik Lāl Gupta.
3. By Kālīśa Candra Vidyāratna.

Besides these books, the number of Sanskrit medical works is simply legion; many of them are daubed with fancy names and are excellent treatises on the different branches of medical science. But they are quite foreign to our purpose. I intend to publish in a separate volume short notices of the medical authors and their works, and so we need not dwell on them here.

1. पारसीक यवानौ तु यवानौ सदृशी गुणैः ।
विशेषात् पाचनी रुच्या ग्राहिणी मादिनी गुरुः ॥

Bhāva Prakāśa, I.

पारसीकवचा युक्ता प्रीक्ता हैमवतीति सा ।
हैमवत्युदिता तद्वद्वातं हन्ति विशेषतः ॥

Ibid.

उक्तं खसफलचौरमाफुकसहिफेणकम् ।

Ibid.

चीनाक सन्नः कर्पूरः कफचयकरः स्मृतः ।

Ibid.

खज्जुरी गीसनाकारा परहीपादिहागता ॥

Ibid.

CHAPTER II.

HOSPITALS AND DISPENSARIES.

Before entering into our proper subject, it would not be amiss to notice here two objects—Hospitals and Anæsthetics—which are essentially necessary for the development of surgical knowledge. We know from the Edict II of Aśoka that India during his reign was studded with hospitals not only for the treatment of human beings but also for the brute creations. But even before Aśoka, hospitals flourished in India. In Caraka we can trace the germ of such an institution though it was used for rich men and did not accommodate the public.¹

¹ दृढं निवातं प्रवातेकदेशं सुखप्रविचारमनुपत्यकं धूमातपरजसामनभिगमनीयमनिष्टानाञ्च शब्द-स्थर्ग-रस-रूप-गन्धानां सीपानीद्रूमलमुषलवर्षःस्थानस्नानभूमिमहानसीपितं वास्तुविद्या-कुशलः प्रशस्तं गृहमेव तावत् पूर्वमुपकल्पयेत् ।

ततः शीलश्रीचातुरागदाद्यप्रादक्षिणीपपन्नानुपचारकुशलान् सर्व्वकर्म्मसु पर्यवदातान् स्पीदनपाचकस्नापकसंवाहकीत्यापकसंवेशकौषधपेषकांश्च परिचारकान् सर्व्वकर्म्मस्वप्रति-कुलान् । तथा गीतवादित्रीह्लापकस्त्रीकगाथाख्यायिकेतिहास-पुराणकुशलानाभिप्राय-ज्ञाननु-मतांश्च देशकालविदः परिषदांश्च । तथा लावकपिञ्जलशशहरिणैर्नकालपुच्छकमृगमातृकी-रभान् । गाञ्च दीर्घ्वां शीलवतीमनातुरां जीवद्गत्सां सुप्रतिविहितदृष्टशरस्वपानौयाम् । जल-पाचाचमनीदकीष्ठमणिकपिठरघटकुम्भीकुम्भकुण्डशरावदर्व्वीकपरीपचनमस्थानचेलसूचकार्पासी-णादीनि च शयनासनादीनि चौपन्यस्तम्भङ्गारप्रतियद्वाणि सुप्रयुक्ताक्षरणीतरप्रच्छदो-पधानानि स्वापान्शयानि संवेशनीपवेशनक्षेत्रलेदाभ्यङ्गप्रदेहे परिषेकानुलेपनवसनविरचिना-स्थापनानुवासन-शिरीविरचनमुचीक्षारकर्म्माणामुपचारसुखानिसुप्रक्षालितोपधानाञ्च श्लक्ष्णखर-मभ्यामा दृशद् शस्त्राणि चोपकरणार्थानि ।

धूमनेत्रं वस्त्रिनेत्रचोत्तरवस्त्रिकञ्च । कुशहस्तञ्च तुलाञ्च मानभाण्डञ्च घृततैलवसामञ्जौद्र-फाणितलवणेस्वनीदक-मनुसुरासीवीरकतुषीदकमैरेयमेदकदधिमण्डोदग्निवज्जानाग्रास्त्रमुवाणि च । तथा श्रावणशिकमुद्गमाषयवतिलकुलल्यबदरहृदीकापरूषकाभयामलकबिभीतकानि नाना-विधानि च क्षेत्रोदापकरणानि द्रव्याणि तथैवोद्दहरणानुलोमिकोभयभाजि संयुक्तनीयदीप-नीयपाचनीयीपशमनीयवातहृराणि समाख्यातानि चौषधानि यश्चाग्यदपि किञ्चिद्वापदः परिसंख्यायीपकरणं विद्यते यच्च प्रतिभीगाथं तत्तदुपकल्पयेत् ॥

He advises us as follows:—The engineer is to erect a strong and spacious building, well-ventilated at one part, the other part being free from draughts. The scenery should be pleasing and one should feel happy to walk in it. It must not be behind any high building, nor exposed to the glare of the sun. It should be inaccessible to smoke and dust. There must not be anything injurious to our senses as regards sound, touch, taste, form and smell. There should be stairs, large wooden mortars and pestles; and there must be additional bare ground for the construction of a privy, bath-room and kitchen. The staff should consist of servants and companions. The servants should be good, virtuous, pure, fond, clever, generous, well trained in nursing, skillful in works, able to cook rice and curries well, competent to administer a bath, expert masseur¹, trained in raising and moving a patient, dexterous in making or cleaning beds, practiced in the art of compounding medicines and willing workers not likely to show displeasure to any order. The companions should be good singers and musicians, fluent speakers, well-versed in distichs, ballads, tales, history and mythology, well-acquainted with the design of a patient's nods or signals, agreeable and should have knowledge of the season and the locality. The various kinds of animals

¹ From the accounts of Megasthenes, we learn that four attendants used to massage him (Candragupta) with ebony rollers during the time that he was engaged in disposing of cases. Such an attendant (*saṁvāhaka*) is a minor character in the Toy Cart or little Clay Cart, drama, transl. by Ryder, in Harvard Oriental Series, Vol. IX, 1905—Smith's Early History of India, 2nd Ed., Page 122. Footnote. We also find in the Kāmandikya Nīṭisāra that the king is cautioned against shampooers who have the opportunity of poisoning him.

सूद्व्यञ्जनकर्तारस्तत्पका व्ययकास्तथा ।

प्रसाधका भीजकाश्च गात्रसंवाहका अपि ॥

should always be kept in stock such as Lāva (*Perdix Chinensis*), Kapiñjala (partridge), hares, sheep and the different kinds of deers, Ena (the black antelope) blacktailed deer, and Mrgamātrka. There should be a diary attached to the building. The cow should be good natured and healthy, and should yield profuse milk. The calves must be living. There should be stocked for them potable water and hay in a clean fold. In that building must be kept the following necessary articles:—

Water vessels, washing basins, tubs, jars, dishes, ghata, (small jars) kumbhī, kumbha (larger and smaller vessels), kundu (jug or pitcher), soraba (earthen basins), spoons or ladles, cooking utensils, churning rods, cloth, thread, cotton, wool, bedding and āsana (seats). Near them should be placed drinking vessels of gold and spittoons. The bedding should consist of a broad carpet, bed-sheet, pillows, and a bedstead. There should be collected good furnitures for beds and seats; and also utensils and appliances for application of oleaginous medicines, heat, oil, ointment, bath and perfumeries, and for the acts of emesis, purgation, draining of the brain, injection into the rectum, defaecation and urination (i.e. Vastī-yantra, urinal, bed-pan &c.). The blunt and sharp instruments and their accessories, well-washed mullers and whetstones of different degrees of smoothness—polished, plain or rough—should be near at hand; the tubular instruments for fumigation, inhalation and injection into the rectum, urethra and vagina, should be available there; and the following articles are also to be stocked:—brushes and brooms, weighing scales and weights, ghee (melted butter), oil, fat, marrow, honey, molasses, salt, wood, water, spirituous liquor formed by steeping husked grains of barley in water, or by boiling together the husks of fried māskalāya

(pulse of Phaseolous Rox.), barley and water, spirituous liquor from the blossoms of *Lythrum Fruticoscence* with sugar, spirit distilled from the different sorts of grains, curdled milk, rice, gruel, whey, sour liquid produced from the acetous fermentation of powdered paddy, and the various kinds of urines of animals. Different kinds of rice such as *Śālī* (or that reaped in cold season) and *Saṣṭhika* (or that grown in hot weather in low lands and reaped within sixty days of its sowing), *Mudga* (*Phaseolus mungo*), *Māṣa* (*Phaseolus Rox.*), *Yava* (*Hordeum Vulgare*), sesame (*Seasamum Indicum*), *Kullatha* (*Dolichos Biflorus*), plums (*Zizyphus Jujube*), raisins (*Vitis Vinifera*), *Paruṣa* (*Grewia Asiatica*), *Abhayā* (*Chebolic Myrobolan*), *Āmlakī* (*Phyllanthus Emblica*), *Vibhitaka* (*Terminalia Bellerica*) and other classes of medicaments, as oils, diaphoretics, sternutatories, cathartics, emetics, purgatives, astringents, stomachics, digestives, calmatives, carminatives and various other forms of medicines, are required for treatment. Besides these, there must be stored the antidotes to poisons caused by overdoses of medicines and other appliances likely to add to the patient's comfort.

To this may be compared the description of the Greek iatrium, which is mentioned in the Hippocratic treatise, *De Medicio*. He directs that "it should be so constructed that neither the wind nor sun might prove offensive to the patient, and goes on to enumerate the various articles which it should contain, such as scalpels, lancets, cupping-instruments, trepans, raspatories, with bandages and medicines."¹

¹ Works of Hippocrates, Syd. Soc, Vol. II, page 470, Footnote.

Suśruta gives us a list of appliances¹ required in surgical operations:—

1. Blunt Instruments. 2. Sharp Instruments. 3. Potential Caution. 4. Actual Caution. 5. Śalākā or rods. 6. Horns. 7. Leeches. 8. Hollow bottle gourd. 9. Jāmbav-ouṣṭha [a bougie of blackstone, the extremity of which is shaped like the fruit of the Jambul tree (*Urginea Jāmbolana*)]. 10. Cotton. 11. Pieces of cloth. 12. Thread. 13. Leaves. 14. Materials of bandaging. 15. Honey. 16. Ghṛe, or clarified butter. 17. Suet. 18. Milk. 19. Oils. 20. Tarpan.—flour of any perched grain or condensed milk etc. mixed with water to mitigate thirst. 21. Decoctions. 22. Liniments. 23. Plasters. 24. Fan. 25. Cold and hot water. 26. Iron pans, kalasi and other earthen vessels; beddings and seats. 27. Obedient, steady and strong servants.

The Lying-in-room.—Caraka says: "Before the ninth month of pregnancy, the lying-in-room should be constructed. The land should be cleaned of bones, gravels and potsherds. The ground selected should be of auspicious colour, taste and smell. The gate of the house should face towards the east or the north.² There must be a store of wood such as Vilva (*Ægle*

¹ अतोऽनामतं कर्म चिकीर्षता ज्येष्ठेन पूर्णमेवोपकल्पयितव्यानि तद्वयथा यन्मशस्त्रचाराग्नि-
शलाकाश्चञ्जलौकालावूजास्त्वबीठपिचूरीतस्त्रपत्रपट्टमधूततवापयस्त्रैलतर्पनकाषायलेपन कस्त्र-
व्यजनशीतीशीदक कटाहदीनि पारकर्मणश्च स्निग्धाः स्थिरा बलवन्तः ।

Suśruta Saṁhitā. I. v.

² "The best sort of ground should abound with milky trees, full of fruits and flowers; its boundary should be of a quadrangular form, level and smooth, with a sloping declivity towards the east producing a hard sound, with a stream running from left to right, of an agreeable colour, fertile, of an uniform

Marmelos), Tinduka (*Diospyros Embryopteris*), Inguda (*Balanites* Rox.) Bhallākaka (*Semecarpus Anacardium*), Vāruṇa (*Ocimum Basilicum*), Khadira (*Acacia Catechu*) or wood of other kinds said to be auspicious by a Brāhman versed in the Atharvaveda, and there must be a sufficient provision for clothes, liniments, and covers. For the pregnant woman, be careful to have a fire-place, water, pestles and mortars, a privy, a bathing place, and ovens. These should be constructed according to the science of engineering and should be pleasant with regard to the season. There should be collected clarified butter, oil, honey, different kinds of salts as rock salt, sonchal salt, and black salt, Viḍaṅgas (*Embelic Ribes*), treacle, Kuṣṭha (*Saussurea Lappa*), Kilima (*Pinus Deodara*), Nāgara (dried root of *Zinziber Officinale*), Pippali (*Piper Longum*), its root, Hastipippali (*Scindaspus Officinalis*), Mandukparni (*Hydrocotyle Asiatica*), Elā (*Elettarium Cardamomum*), Lāngolī (*Gloriosa Superba*), Vāca (*Acorus Calamus*), Cavya (*Piper Cava*), Chitraka (*Plumbago Zeylanicum*), Chiravilva (*Pongamia Glabra*), Hingu (*Ferrula Assafætida*), Sarsapa (Mustard seeds), Laṣuna (*Allium Sativum*), finely or thickly powdered rice, Kadamba (*Anthocephalous Kadamba*), Ātasi (*Linum Usitatissimum*), Vallīja (*Cucurbita Pepo*), Bhurya (*Betula Bhojpatra*), Kulatha (*Dolichos Uniflorus*), Maireya (a spirituous liquor from the blossoms of *Lythrum Frutecoscence*) and Āshava (Vinous fermented liquor from sugar or molasses, Rum). Also collect two pieces of

colour containing a great quantity of soil, producing water when dug to the height of a man's arm raised above his head, and situated in a climate of moderate temperature."

Manosara, Ch. I. quoted in Ram Raz's *The Architecture of the Hindus*, Page 16.

stone (muller and stone slabs), two pestles, two mortars, an ass, a bullock, two sharp needles of gold and silver, two skeins of threads, sharp instruments of steel, two wooden bedsteads (*Ægle Marmelos*), and wood (*Tinduka* and *Ingudi*) for easily igniting fire. The female attendants should be mothers of children, and friends and relatives of the patients. They must be fond of her, skillful in work, intelligent, jolly, laborious full of tender love for the children and a favourite of the mother."¹

The Child's Room.:—He continues—"The engineer is to construct a room, spacious, beautiful, full of light, well-ventilated but free from draughts, strong, and free from beasts of prey, animals with fangs, mice and insects. There should be kept water, mortar and separate places should be assigned for bathing, cooking, urination and defæcation. It should suit the season of the year. The beddings, seats and covers should be comfortable and suitable to the season. Auspicious ceremonies should be performed in that room such as *homa*, expiations and presents to gods, for the proper protection of the child; and there should be present pious old men, doctors, and devoted

¹ प्राक् चैवासा नवमान्मासात् सुतिकागारं कारयेदपद्धतास्थिर्गर्भराकपासिदेशं प्रशस्त-
परसगन्धार्या भूमौ प्राग्द्वारमुदगद्वारं वा । तत्र वैखानां काष्ठानां तिलुकैश्चुदानां भक्ष्यात-
कार्णां वाक्पाणां खदिरानां वा यानि चानान्यपि ब्राह्मणाः शंसेयुरथर्ववेदविदस्तद्वसनलेप-
नां हिन्दुनापिधानसम्पदुपेतं तत् । वास्तु-विद्या-हृदययोगेनाग्निमसिलीलुखलवर्षः स्थानञ्चानभूमि-
महानसद्यस्तुसुखं । तत्र सर्पिलेखमण्डसैवसौवर्षलकाललवणविङ्कगुङ्कुठकिलिमनागर-
पिपलीमूलहस्तिपिपलीमखूपैर्षालाङ्गलीवचाचव्यचिचकचिरविल्व-ह्रिज्जुर्मर्ष लघुनकन-
कनिकाजीपातसीवस्त्रिजभूम्नाः कुलत्थमैर्यसुरासवाः सन्निहिताः स्याः ॥ तथाऽस्मान्नी
ह्रीं हे चण्डमूलं हे चण्डमुखं खरीं वषभं ह्रीं च तीक्ष्णौ सूक्ष्मौ पिपलकौ सौवर्णराजतौ ह्रीं
शस्त्राणि च तीक्ष्णायसानि ह्रीं च विल्वमयीं पथ्यं ह्रीं तैन्दुकैश्चुदानि काष्ठान्यग्निमस्युत्पन्नानि
स्त्रियं वज्रो वज्रः प्रजाताः सौहार्दयुक्ताः सततमनुरक्ताः प्रदक्षिणाचाराः प्रतिपत्तिकुशलाः
प्रकृतिवत्सलास्त्रकविधादाः क्षेमसङ्घिषवीऽभिमता ब्राह्मणस्याथर्ववेदविदी यच्चान्यदपि तेषां
समर्थं भवेत् यच्च ब्राह्मणाः ब्रूयुः स्त्रियं वृद्धास्तु कार्यम् ॥

attendants constantly. The child's bed, covers and sheets should be soft, light, pure and scented. These should always be free from sweat, dirt, worms or bugs, urine and fæces. If repeated change of new clothes be impossible, the soiled coverings should be well washed and the beddings well purified with steam and thoroughly dried before they are used again. To purify or sterilise the dress, beddings, coverings and sheets by fumigation use the following medicines with clarified butter:—Barley (*Hordeum Vulgare*), mustard seeds, linseeds, assafoetida, Guggula (*Balsamodendron Mukul*), Vāca (*Acorus Calamus*), Coraka (*Andropogon Acicularis*), Vayasthā (*Chebulic Myrobolan*), Golomi (*Panicum Dactylon*), Jaṭilā (*Nardostachys Jatamansi*), Palankaṣā (a variety of Guggula), Aśoka (*Saraca Indica*), Rohiṇī (*Picrorrhiza Kurroa*) and sankes' skin.....A variety of toys to please the child should be at hand and these should be coloured, light, musical, beautiful and must not be sharp pointed. They should be of such a size and shape as cannot be put into the child's mouth or do not terrify or kill the child."¹

¹ अतीऽनन्तरं कुमारारागविधिमनुष्याख्यास्यामः ॥ वास्तुविद्याकुशलः प्रशस्तं रसमतमस्तं निवातं प्रवातैकदेशं दृढमपगतश्वापदपशुदंष्ट्रिमूषिकपतङ्गं सुसंविभक्तसखिलीदूखलमूचवर्षः—स्थानस्नानभूमिसहानसश्चतुस्रं यद्यत्तु शयनासनासारणसम्पन्नं कुर्यात् । तथा सुविहित-रक्षाविधानवल्लिख्यलक्ष्मीप्रायश्चित्तं शुचिद्वज्रवैद्यातुरक्ताजनसम्पूर्णमिति । कुमारारागविधिः ॥ शयनासारणप्रावरणानि कुमारस्य स्तदुल्लुप्युच्चिसुगन्धीनि स्युः । स्वेदमलजनुमनि मूत्रपूरी-षीपसृष्टानि च वैज्यानि स्युः ॥ असति सन्धवेऽन्येषां तान्येव च सुप्रक्षालितपीधानानि सुधूपितानि सुशुद्धशुक्लाभ्युपवीगं गच्छेयुः । धूपनानि पुनर्वाससां शयनासारणप्रावरणानाञ्च यवसर्षपातसीहिङ्गुगुग्गुलवचाचौरकवयः स्थागिलीलीजटिलापलङ्कषाशीकरोहिणीसर्पनिम्बोकाणि धृतसम्प्रयुक्तानि स्युः ॥ मणयश्च धारणीयाः कुमारस्य खड्गखरगवयवृषभानां जीवतामेव दक्षिण्येथी विषाक्ष्येथीऽयाणि गृहीतानि स्युः । मन्त्राद्याद्वीषवयी जीवकर्षभकौ च यान्यन्यानि ब्राह्मणाः प्रशंसिष्युः । ब्रौडनकानि खल्वस्य तु विचित्राणि घोषवन्धभिरा-माणि अगुरुस्थतीक्षायां अनस्यप्रवेशीनि अप्राणहराणि भविवासानानि स्युः ॥

Caraka Saṁhitā IV. viii.

Suśruta directs that there should be a particular room provided for patients who have undergone surgical operations.¹ "Patients suffering from surgical diseases as inflammatory swelling, wounds &c. should, from the very commencement of their illness, confine themselves inside a clean house, situated in a wholesome locality, free from draughts and not exposed to the glare of the sun. For, in such a building, constitutional, mental and accidental diseases are not likely to occur. In that room, the bed for the patients should be soft, spacious, and well-arranged. The patient should lie down, his

¹ ग्रथिनः प्रथममेवागारमन्विच्छेत्तन्नागारं प्रशस्तवास्तादिकं कार्यं ।

प्रशस्तवास्तुनिगृहे शुचावातपवर्जिते ।

निवाते न च रोगाः स्युः शारीरागन्तुमानसाः ॥

तस्मिन् शयनमसम्बाधं स्नास्त्रीर्णं मनीषं प्राक्शिरस्तं सशस्त्रं कुर्वीत ।

मुखचेष्टाप्रचारः सप्तात् स्नास्त्रीर्णं शयने ब्रवीत् ।

प्राच्यां दिशि स्थिता देवास्तत्पूजार्थं नतं शिरः ॥

तस्मिन् सुहृत्त्रिरनुकूलैः प्रियम्बदैरुपास्यमानो यथेष्टमासीत् ।

सुहृदी विचिपन्त्याश्च कथाभिर्ब्रणवेदनाः ।

आश्रवासयन्तो बहुशस्त्रनुकूलाः प्रियम्बदाः ॥

न च दिवानिद्रावशगः सप्तात् ।

दिवास्तप्रादुषे कण्डूर्गोत्राणां गौरवं तथा ।

अयथुर्व्वेदनारागः स्नावश्चैव भृशं भवेत् ॥

उत्थानसंवेशनपरिवर्त्तनचक्रमणौचैर्भाषणादिषु चात्मचेष्टासप्रसक्तौ ब्रणं संरुद्धेत् ।

स्थानासनं चक्रमणं यानयानातिभाषणं ।

ब्रणवान्न निषेवेत शक्तिमानपि मानवः ॥

उत्थानाद्यासनं स्थानं शय्यां धातिनिषेविता ।

प्राप्नुयान्मरुतादङ्गे रुजस्तस्माद्विवर्ज्येत् ॥

शय्यायाञ्च स्त्रीणां सन्दर्शनमसम्भाषणसंस्पर्शनानिदूरतः परिहरेत् ।

head pointing towards the east, and keep there some weapon for his own protection. On such a bed, the patient can lie comfortably and turn to his sides at pleasure. He should be surrounded by his dear friends, for their sweet words relieve the pain of inflammation. The female friends, however, should be avoided and kept at a distance. He should observe strictly the orders of the surgeon as regards his food, drink and mode of living. He should have his hairs clipped and nails pared short, be pure in his person, put on white clothes and devote himself to religious duties. A light should be kept burning; and garlands of flower, weapons &c., should be provided in the room to ward off the demons. He should be cheered and inspired by pleasant stories; and the physicians and the priests should attend the patient morning and evening. Pastils made of *Sinapis Nigra* and *Azadirachta Indica* with clarified butter and salt, should be burnt in the room morning and evening for ten days continually. The inflamed part should be fanned with a *cāmar* or yolk-tail. Sleep during the day, exercise and sexual intercourse must on no account be indulged in."

Suśruta also describes the kitchen of the king thus:—"That is the proper kitchen which is built on good ground, towards an auspicious quarter, full of utensils for cooking, spacious, clean, provided with windows guarded by a network, frequented by friends, cleared well of grass furnished with a canopy, purified by auspicious ceremonies, and managed by men and women of good character. The superintendent of the kitchen should, like the doctor, be noble and virtuous. The cook and servants should be pure, noble, capable, mild, good looking, engaged in their respective duties, high-minded, should have their hairs and nails cut short, steady,

well-bathed, of subdued passion, well-dressed, obedient and have their heads well-covered."

"The doctor in charge of the kitchen should be of noble family, religious, friendly, a clever manager for getting king's food properly prepared, ever careful for his health, non-avaricious, simple, fond, grateful, good-looking, cool-tempered, well-behaved, not proud and envious, laborious, of subdued passion, forgiving, pure, of good character, kind, intelligent, not easily fatigued, always loving, well wisher, capable, bold, clever, skillful, not unreasonably tender, provided with medicines and well proficient in the art of healing."¹

- ¹ कुलौन धार्मिकं क्षिणं सुभृतं सततोत्थितं ।
 अलम्ब्य अशठं भक्तं कृतघ्नं प्रियदर्शनं ॥
 क्रीडपारुष्यमात्सर्यं मदालस्य विवर्जितं ।
 जितेन्द्रियं क्षमावन्तं शुचिं शीलदयान्वितं ॥
 मेघाविनमसंशान्तमनुरक्तं हितैषिणं ।
 पटुं प्रगल्भं निपुणं दक्षं मायाविवर्जितं ॥
 पूर्वोक्तैश्च गुणैर्युक्तं नित्यं सन्निहितागदं ।
 महानसे प्रयुज्येत वैद्यं तद्विद्यपूजितं ॥
 प्रशस्तदिग्दर्शकतं शुचिभाण्डं सहस्रकुचि ।
 सजालकं गवाक्षाढ्य मात्मवर्गं निषेवितं ॥
 विकचसृष्टसंसृष्टं सवितानं कृताञ्जनं ।
 परीक्षित स्त्रीपुरुषं भवेच्चापि महानसं ॥
 तत्राध्यक्षं नियुज्येत प्रायी वैद्यगुणान्वितं ।
 शुचयी दक्षिणा दक्षाः विनीताः प्रियदर्शनाः ॥
 सविभक्ताः सुमनसी नीच केशनखाः स्थिराः ।
 क्राताड्डः संयमिनः कृतोष्णीषाः सुसंयुताः ॥
 तस्याचाञ्चा विधेयास्तु विविधाः परिकर्षिणः ।
 आहारस्थित यथापि भवन्ति प्राणिनी यतः ॥
 तन्मान्महानसे वैद्यः प्रसाद रक्षितो भवेत् ।
 माह्वानसिक वीदारः सौपौदनिक पौपिकाः ॥
 भवेयुर्वैद्यवशगा ये चाप्यन्ये तु केचन ।
 इक्षितज्ञी मनुष्याणां वाक्चेष्टमुखवैकृतेः ॥

In the *Kāmandakiya Nitisāra*, we find the king advised to take thoroughly examined food, and to be surrounded by physicians well-versed in the science of Toxicology ;¹ and again it is said that king should take his medicines, cordials, and edibles after having his medical attendants tasted them.² The king is advised to kill his enemy by weaning over his physician or by administering poisonous liquids.³

In the *Mahāvagga*⁴ we find the qualities of a good patient and a good nurse described :—

" 6. What are five qualities, O Bhikkhus, which when a sickman has, he is easy to wait upon—

When he does do what is good for him ; when he does know the limit (of the quantity of the food) that is good for him ; when he does take his medicine, when he does let a nurse who desires his good, know what manner of disease he has, or when he is getting worse that that is so, or when it is getting better that that is so ; and when he has become able to bear bodily pains that are severe, sharp, grievous, disagreeable, unpleasant and destructive to life. These are the five qualities, O Bhikkhus, which when a sickman has, he is easy to wait upon.

¹ विषशैवकशैः शतः विषहन्निभूयितः ।

परीक्षितं समग्रीवाज्जातुकाविद्विषमृतः ॥ १० ॥

Kāmandakiya Nitisāra vii. v. 113.

² बीजधानि च सर्वानि पानं पानीयमेव च ।

तन्मन्त्रकशैः समान्वाद्य प्राग्ग्रीवाशीजनानि च ॥ १० ॥

Ibid. vii. v. 27.

³ भिषग्भेदेन वा शत्रुं रसदानेन साध्यते ॥ १० ॥

Ibid. ix. v. 73.

⁴ *Mahāvagga* viii. 26. 6 & 8 (*Sacred Books of the East*).

8. There are five qualities, O Bhikkhus, which, when one who waits upon the sick has, he is competent to the task—when he is capable of prescribing medicines; when he does know what (diet) is good and what is not good for the patient, serving what is good and not serving what is not good for him; when he does wait upon the sick out of love, and not out of greed; when he does not revolt from removing evacuation, saliva or vomit; when he is capable of teaching, inciting, arousing and gladdening the patient with religious discourses. These are the five qualities, O Bhikkhus, which, when one who waits upon the sick has, he is competent to the task.”

There is also good deal of evidence to show that medicines were distributed free to the poor and to the pious men. When Viṣakhā asked for eight boons of the Buddha, she mentioned amongst them the privilege of bestowing her life long “food for the sick, food for those who wait upon the sick and medicines for the sick” and explained her reasons as follows¹ :—

“9. Moreover, Lord, if a sick Bhikkhu does not obtain suitable foods, his sickness may increase upon him, or he may die. But if a Bhikkhu have taken the diet that I shall have provided for the sick neither will his sickness increase upon him, nor will he die. It was this circumstance, Lord, that I had in view in desiring to provide the Saṃgha my life long with diet for the sick.

Moreover, Lord, a Bhikkhu who is waiting upon the sick if he has to seek out food for himself, may bring in the food (to the invalid) when the sun is already far on his course, and he will lose the opportunity of taking his food. But when

¹ Mahāvagga VIII, 15-9.

he has partaken of the food I shall have provided for those who wait upon the sick, he will bring in food to the invalid in due time and he will not lose the opportunity of taking his food. It was this circumstances, Lord, that I had in view in desiring to provide the *Samgha* my life long with food for those who wait upon the sick.

10. Moreover, Lord if a sick Bhikkhu does not obtain suitable medicines his sickness may increase upon him, or he may die. But if a Bhikkhu have taken the medicines which I shall have provided for the sick, neither will his sickness increase upon him, nor will he die. It was this circumstance, Lord, that I had in view in desiring to provide the *Samgha*, my life long with medicines for the sick."

The Edict No. II of Aśoka clearly shows that charitable institutions were common in India, during his reign. The Edict runs as follows :—

"Everywhere in the kingdom of the king Piyadasi, beloved of the gods, and also of the nations who live in the frontiers such as the Cholas, the Pandyas, the realms of Satyaputra and Keralaputra, as far as Tambapani, (and in the kingdom of) Antiochus, king of the Greeks and of the kings who are his neighbours, everywhere the king Piyadasi, beloved of the gods, has provided medicines of two sorts, medicines for men and medicines for animals. Wherever plants useful either for men or for animals were wanting they have been imported and planted. Wherever roots and fruits were wanting, they have been imported and planted. And along public roads, wells have been dug for the use of animals and men."

We also learn from Houen Tsang's account that Śīlāditya II

(610 - 650 A. D.) was inclined towards Buddhism and he forbade the slaughter of living animals, built *stupas*, and "in all the highways of the towns and villages throughout India, he erected hospices, provided with food and drink, and stationed there physicians with medicines for travellers and poor persons round about, to be given without any stint."¹

He also mentions about the father of the Bhikkhu Śrutavimsatikopi, that "from his house to the snowy mountains, he had established a succession of rest-houses, from which his servants continually went from one to the other. Whatever valuable medicines were wanted, they communicated the same to each other in order, and so procured them without loss of time, so rich was this family."²

He also mentions charitable institutions called *Punyaśālās* as common in India. "There were formerly in this country (Tsch-kia-Takka) many houses of charity (goodness or happiness, *Punyaśālās*) for keeping the poor and the unfortunate. They provided for them medicines and food, clothing and necessaries; so that travellers were never badly off."³

Again he says: "Benevolent kings have founded here (Mo-ti-pil-lo or Matipura) a house of "merit" (*Punyaśālās*). This foundation is endowed with funds for providing choice food and medicines to bestow in charity on widows and bereaved persons, on orphans and the destitute."⁴ A similar *Punyaśālā* or hospice was in K'ei-P'an-to (Kabandha).⁵ In describing

¹ Beal's Record, Vol. I, p. 214.

² *Ibid*, Vol. II, p. 188.

³ *Ibid*, Vol. I, p. 165.

⁴ *Ibid*, Vol. I, p. 198.

⁵ *Ibid*, Vol. II, p. 303.

Multan he says: "They have founded a house of mercy (happiness), in which they provide food, and drink, and medicines for the poor, and sick, affording succour and sustenance."¹ Of Śilāditya he says: "Every year he assembled the Sramanas from all countries, and on the third and seventh days he bestowed on them in charity four kinds of Alms (*viz.*—food, drink, medicine, clothing)."²

Fa Hian (405-11 A.D.), a contemporary of Candragupta Vikramāditya, describes the charitable dispensaries in the town of Pāṭāliputra thus:—"The nobles and householders of this country have founded hospitals within the city to which the poor of all countries, the destitute, cripple and the diseased may repair. They receive every kind of requisite help gratuitously. Physicians inspect their diseases, and according to their cases order them food and drink, medicines or decoctions, every thing in fact that may contribute to their ease. When cured, —they depart at their convenience."³ Smith remarks: "No such foundation was to be seen elsewhere in the world at this date; and its existence, anticipating the deeds of modern Christian charity, speaks well both for the character of the citizens who endowed it, and for the genius of the great Aśoka whose teaching still bore such wholesome fruit many centuries after his decease. The earliest hospital in Europe, the *Maison Dieu* of Paris, is said to have been opened in the 7th centuries."⁴

"Upatisso, son of Buddha Das, builds Hospitals for cripples,

¹ Beal's Record, Vol. II, p. 274.

² *Ibid*, Vol. I, p. 214.

³ *Ibid*, Vol. I, Intro. lci.

⁴ Smith's Early History of India, 2nd Ed., p. 280.

for pregnant women, and for the blind and diseased.¹ Dhatushenn builds Hospitals for cripples and sick². Buddha Das³ himself ordained a physician for every ten villages on the high road, and built assylums for the crippled, deformed and destitute."⁴

The animal Hospitals or Pinjrapoles which still exist at Ahmedabad, Surat, and Sodepore in Bengal, and elsewhere may be regarded as the survivals of the institutions founded by the Maurya monarch. The following account of the Surat Hospital in the 18th century is from the pen of Hamilton:—

"The most remarkable institution in Surat is the Banyan Hospital, of which we have no description more recent than 1780. It then consisted of a large piece of ground enclosed by high walls, and sub-divided into several courts or yards for the accommodation of animals. In sickness they were attended with the greatest care, and here found a peaceful assylum for the infirmities of old age.

"When an animal broke a limb, or was otherwise disabled, his owner brought him to the Hospital, when he was received without regard to the caste or nation of his master. In 1772 this hospital contained horse, mules, oxen, sheep, goats, monkeys, poultry, pigeons, and variety of birds; and also an aged tortoise, which was known to have been there seventy-five years. The most extraordinary ward was that appropriated for rats, mice, bugs, and other noxious vermins for whom suitable food was provided."⁵

¹ Mahāwanso, p. 249.

² *Ibid.*, p. 245.

³ *Ibid.*, p. 256.

⁴ Cunningham's Bhilsa Topes, p. 54, *foot note*.

⁵ Hamilton's Description of Hindustan (120) Vol. I, p. 718, quarto ed. Crooke. Things Indian, Art. Pinjrapole, (Murray 1906).

We quote here from Hemādri the opinions of the sages and the Purāṇas as to the merit of the founder of a hospital¹ :—

Visvāmītra.

There is no gift more precious than the gift of cure ; therefore it should be given freely to the sick to augment one's good fortune. He who gives medicines, diet, food, oil for smearing and shelter to the sick, becomes free from all diseases.

Samvartta.

The giver of medicines, oleaginous remedies and food for the cure of the sick, becomes free from all diseases, happy and long-lived.

Agastya.

Those who give rice and medicines freely attain happiness, being free from disease.

Saura Purāṇa.

He, who gives medicines to the sick to cure their diseases always remains healthy, long-lived and happy.

¹ अथ आरोग्यदानं ।

तच्चारोग्यदानत्वात् दुच्यते ।

आह विश्वामित्रः ।

आरोग्यदानात्परमं न दानं विद्यते कश्चित् ।

अतीदर्यं राजार्चानामारोग्यं भाग्यवद्भवे ॥

अथैषं पथ्यमाहारं तैलाभ्यङ्गप्रतिश्रयं ।

यः प्रयच्छति रोगिभ्यः समवेक्ष्य प्राप्तिवर्जितः ॥

संवर्तः ।

अथैषं खेद-माहारं रोगिणां रोगशान्तये ।

ददानो रोगरहितः सुखी दीर्घायुरेव च ॥

Nandi Purāna.

The high-souled man who gives the Brahmins collyrium in charity to cure the diseases of the eye, goes to the Sun (after death) and becomes free from eye diseases, fine-looking and fortunate.

Good health is a step to the acquirement of religious merit, wealth, pleasure and final emancipation, and so the man who bestows cure to the sick and also he who erects a hospital equipped with good medicaments, dresses, learned doctors, servants and rooms for students, always gain them. The doctor should be well-versed in the religious treatises, experienced, familiar with the actions of medicines, a discriminator of the colour of the roots of the herbals and well-acquainted with the

अगस्त्यः ।

अग्नौ-षधप्रदातारः सुखं याति निरामयाः ।

सौर पुराणे ।

रोगिणी रोगशान्तर्यमौषधं यः प्रयच्छति ।

रोगहीनः स दीर्घायुः सुखी भवति सर्वदा ॥

नन्दि पुराणे ।

अञ्जनं यो नरोदद्यादक्षौर्व्याधिनिवृत्तये ।

विप्राय स पुमान् याति सूर्यलोकां महानतिः ।

आरोग्यनयनी दिव्यः सुभगी जायते नरः ॥

तस्मिन्नेव पुराणे ।

धर्मा-र्थ-काम-मोक्षाणां आरोग्यं साधनैर्युतः ।

अतस्सारोग्यदानेन नरो भवति सर्वदा ॥

आरोग्यशालां कुरुते महौषधपरिष्कारा ।

विदग्धवैद्यसंयुक्तां चित्वावसथसंयुतां ॥

proper season of raising them from the ground, well-trained with the qualities of the juices, (their strength and actions), sālī rice, meat and medicaments, trained in compounding medicines, one who knows well of the physique of men by intelligence, one who knows the temperament and the qualities of the diet, a pathologist who is not idle, well acquainted with the remedial agents for the premonitory signs and sequelæ of diseases, proficient in the requirements of time and place, well-read in the medical text-books—the Ayurveda with its eight divisions and an expert in curing diseases by domestic remedies (prepared from handful of common ingredients).

The pious man who erects such a hospital in which the services of good physicians of this nature are retained, becomes celebrated as the virtuous, the successful and the intelligent

वैद्यस्तु शास्त्रवित् प्राज्ञो दृष्टौषधपराक्रमः ।

औषधीमूलवर्णज्ञः समुद्धरणकालवित् ॥

रसवीर्यविपाकज्ञः शालिमांसौषधीगणैः ।

योगविद्वेहिनां दिङ् यो धिया प्रविशेद्बुधः ॥

धातुपथ्यमयज्ञश्च निदानविदतन्द्रितः ।

व्याधीनां पूर्वलिङ्गज्ञस्तदुत्तरविधानवित् ॥

देशकालविधानशिक्षित्साशास्त्रवित्तथा ।

अष्टाङ्गायुर्वेदवित्ता मुष्टियोगविधानवित् ॥

अष्टावङ्गानि आयुर्वेदस्य ।

यथाशब्दं शालाक्यं कायचिकित्सा भूतविद्या कौमारभृत्यमगदतन्त्रं रसायनतन्त्रं बाजी-
करणतन्त्रमिति सुश्रुतोक्तानि ।

एवं विधः शुभो वैद्यो भवेद्यत्राभिर्योजितः ।

आरोग्यशालामवन्तु कुर्थाद्यधीधर्मसंश्रयः ॥

स पुमान् धार्मिको लोके स हतार्थः सवुद्धिमान् ।

सम्यग्आरोग्यशालायामौषधैः सेद्धपाचनैः ॥

man in this world. If in such a hospital the kind-hearted man can cure a single patient of his maladies by simple medicines, oleaginous remedies and compounds of medicinal decoctions, goes to the Brahma's residence with his seven generations upwards. The rich and the poor acquire religious merit in proportion to the amount of riches they possess ; where would the poor man get a hospital and a young physician to cure his diseases ? The man secures the eternal regions mentioned before by rendering the sick healthy by the use of roots to some and by good rubbing (with external applications) to others. He who cures the sick suffering from an increase or decrease of the Air, the Bile and the Phlegm by simple remedies, he too goes to such blessed regions (after death) as are secured by those who perform many religious sacrifices (Yajñas).

व्याधिर्न विरुज्जी कृत्य अथैकं कुरुष्यायुतः ।
 प्रयाति ब्रह्मसदनं कुलसप्तकसंयुतः ॥
 आरोग्यं विज्ञानसारेण दरिद्रः फलभाग् भवेत् ।
 दरिद्रस्य कुतः शाला आरोग्याय भिषग् युवा ॥
 अपिभूलेन केनापि मर्द्दनाद्यैरयापि वा ।
 स्वस्थीकृते भवेन्मर्त्तं पूर्व्वीर्त्तं लोकमव्ययं ॥
 वात-पित्त-कफाद्यानां चया-पचयभेदिनां ।
 यस्तु स्वस्वाभ्युपायेन मोचयेत् व्याधिपीडितान् ॥
 सीपि याति शुभान् लोकान् अवाप्यान् यज्ञयाजिभिः ।

स्कन्दपुराणे ।

आरोग्यं शालां यः कुर्यात् महावैद्यपुरस्कृतां ।
 सर्व्वोपकारणीयेतां तस्य पुण्यफलं श्रेष्ठम् ॥
 चर्म्म-रक्त-काम-मोक्षाणामारोग्यं साधनं यतः ।
 तस्यादारोग्यं दानेन तद्वत् स्थावतुष्टयं ॥
 अथैकमासं विहासं स्वस्थीकृत्य प्रयत्नतः ।
 प्राप्नोति सुमहत्पुण्यमनन्तं क्षयवर्जितं ॥
 शानयोगरतं शान्तं रोगार्त्तं शिवयोगिनं ।
 यः स्वस्थं कुरुते सीपि सर्व्वदानफलं लभेत् ॥

Skandapurāna.

Hear, the amount of religious merit secured by a man who erects a hospital containing all the necessary articles (of treatment) and in which are engaged eminent physicians by reward. As good health is the means of attaining religious merit, wealth, pleasure and final emancipation, therefore, he by rendering the sick healthy, gives these four blessings.

By carefully curing a learned man of his sickness great merit is secured, which is eternal and indestructible. He too who cures a sickman who is calm and absorbed in meditation of Siva and knowledge, attains the virtue of all kinds of gifts. Bramhā, Viṣṇu, all the gods, diseases, relatives and kings—they are obstacles to yoga but not to those who perform it (yogi). Whatever merit is obtained by the great, by supporting the sick Brāhmanas (priests), Kshatriyas (warriors), and Bīṣh (cultivators) and Sudras (servants), can not be obtained by the performance of all the great Yajñas (religious ceremonies). As even the gods can not reach the end of the

ब्रह्मा विश्वः सुराः सर्वे व्याधयः खलना नृपाः ।

योगस्यैते महाविघ्ना व्याधयस्ते न योगिनाः * ॥

ब्रह्म-क्षत्रिय-विट्-शूद्रान् रोगान्तां परिपाल्य च ।

यत्पुण्यं महदाप्नोति न तत्सर्वमहामखैः ॥

आकाशस्य यथा नान्तः सुरैरप्युपलभ्यते ।

तद्वदारीग्यदानस्य नान्तो वै विद्यते क्वचित् ॥

पुण्येनानेन महता गत्वा शिवपुरं नरः ।

मीदते विविधैर्भोगैर्विमानैः सर्वकामिकैः ।

एकविंशत्कुलीपेतः सभृत्यः परिपालितः ।

आस्ते शिवपुरे शिवदावदाहृतसंज्ञकः ॥

ततः स्रग्धर्कशेषि संप्राप्तः प्रयतः सदा ।

ज्ञानमुत्पद्यते तस्य ब्रह्मैव परिचारकः ॥

* स्वेन योगिनामिति वा पाठः ।

firmament, so there is no end (to the merit) of the gift of cure. By this great merit, the man reaching the region of Siva enjoys himself by soaring in a balloon which can go to the various desired directions. With his twenty-one generations upwards and surrounded by his servants, he stays in the Siva's realm so long till deluge does not occur. There, after the lapse of his merit, the devoted servant acquires knowledge from Siva.

Abandoning this world by knowledge, abiding by the prayers to Siva, and casting away this body as a straw, he reaches beyond the limits of sorrow. Being freed from all sorrows, becoming pure, all-knowing and self-sufficient, and absorbed in his ownself, they are called the Liberated. Therefore to mitigate the diseases, the sick should be well nursed; the great sages should especially be attended to even by the sacrifice of one's body or riches. The wise must not irritate the weak patients, and they like the preceptors should be rescued constantly from sins. He who relieves the sick, by taking them under his care, reaches the other bank of this ocean of world.

ज्ञानाद्विरक्तः संसाराच्छिवध्यानमुपार्श्वतः ।
 स्वदेहं दृश्यवत्प्राक्ता सर्वदुःखान्तमाप्नुयात् ॥
 समस्तदुःखनिर्मुक्तः शुद्धः स्वात्मव्यवस्थितः ।
 सर्वज्ञः परिपूर्णश्च मुक्त इत्यभिधीयते ॥
 तस्माद्भोगापवर्गार्थं रोगार्थं समुपाचरेत् ।
 विशेषेण तु योगीन्द्रं शरीरेण चनेन च ॥
 रोगिणी नीडिजेत् प्राज्ञी दुर्बलानपि सर्वदा ।
 तान् पापाद्ब्रुवन्नित्यमेवन्मर्त्यः प्रवर्धते ॥
 योग्यद्विहीतमात्मानं मन्त्रमानी दिने दिने ।
 उपसर्पेत रोगार्थस्तीर्णस्तेन भवार्णवः ॥

इत्यारोग्यदानं ।

Hemādri's Caturvarga, Cintāmoni, Dāna Khaṇḍam.
 Asiatic Soc. Ed. Ch. XIII. P. 891—95.

After these proofs, the statement of Mr. Ameer Ali that "the Arabs invented chemical pharmacy, and were the founders of those institutions which are now called dispensaries"¹ can not be accepted as correct.

DISPENSARIES.

As regards dispensaries, Suśruta advises the physician to construct his dispensary in a clean locality; and the building should face towards some auspicious direction as the east or the north. He says:—"The medicines should be kept in burnt earthen pots arranged on planks supported by stakes or pins".² This is still the method of storing medicines used by the *Kavirājas*. Dallvana explains the passage thus:—"The medicines should be kept in pieces of cloth, earthen pots, wooden pots and Śaṅku (kilaka)."³ The former explanation is plausible for it is impossible to imagine how a kilaka or stake can be a container of medicine, unless it is implied as a point of support for hanging the medicine vials from it.

Dr. Heyne (1814) thus describes the ancient dispensaries of the Hindus: "The place in which medicines are kept should

¹ History of the Saracens p. 262, 1899.

² ङीतसृङ्गाण्डफलकशङ्खुविन्यस्तभेषजं
प्रशस्तायां दिशि शुचौ भेषजागारमिष्यते ॥

Suśruta Saṁhitā, I. xxxvii.

³ सृङ्गीतौषधसंस्थापनोपायं दर्शयन्नाहः,—ङीतेति । ङीतः कर्पटखण्डं, सदा भाण्डं, सृत्भाण्डं । फलकं पट्टकं इति पुस्तकान्तरे पाठः, शङ्खुः कौलकः, एतेषु ङीतादिषु विन्यस्तं धृतं भेषजं यस्मिन् सृङ्गे तत् भेषजागारं भेषजसृङ्गमिष्यते इति सम्बन्धः । प्रशस्तायां दिशि पूर्वस्यामुत्तरस्थां वा, शुचौ देशे यस्मिन् भूमिप्रविभागीयाध्याये, निबन्धेषु व्यत्ययेन न पाठी दृश्यते । अस्माभिसु वृद्धक्रमरीत्यैव पाठी लिखित इति सर्वोपयवसाधेयित्यादि यावन्नवं द्रव्यं पुराणश्चेति पाठं केचिदाचार्या न पठन्ति ॥

Dallvana's Commentary.

be clean, dry, and not accessible to rats, white ants or dust. The drugs ought to be put in nets, or large pots, the mouth of which must be tied over with a piece of cloth, and suspended in a room. Fire, smoke and water must be kept at a distance.

The house in which medicines are stored, should be neither in too high nor too low a situation, and it should not be far distant from places in which medicines may be collected. Its front should face either the south or the north, with a convenient *viranda* before the door of the same side.

The necessary apparatus for mortars, scales, &c., must be kept in a place in the wall that has been consecrated for that purpose by religious ceremonies."

After describing the different classes, and members composing each class, of medicines, Suśruta continues: "The wise physician should collect and classify these medicines, and with them prepare external applications, infusions, oils, ghee, syrups, &c., as required for derangement of a particular humour. The medicines should be carefully preserved in all seasons, in rooms free from smoke, rain, wind and dust. The medicines should be used singly, or in combinations of several medicines of a class, or of an entire group, or of more than one group, according to the nature of the disease, and the extent of derangement of the humours."¹

¹ एभिर्लेपान् कषयांश्च तैलं सर्पिर्विषानकान् ।
प्रविभज्य यथान्यायं कुर्वीत सत्सिद्धान् भिषक् ॥
घृणवर्षानिलक्षेदेः सर्वसुखनमिद्रुते ।
ग्राहयित्वा गृहे न्यस्येद्विघ्नौषधसंग्रहं ॥
समौत्थ दोषभेदांश्च गणान् भिन्नान् प्रयोजयेत् ।
इत्यष्टिग्राह्यं समस्तान् वा गणं वा व्यस्तसंहतं ॥

ANÆSTHETICS.

In the medical text books of the Hindus, there is no mention of a general anæsthetic, from which we can infer that it was unknown in those ancient days. There are, however, many indications to show that the earlier surgeons felt the necessity of such an agent to produce insensibility to pain. Both Caraka and Suśruta mention the use of wine to produce the desired effect. Caraka says: "After extraction of a dead fetus before the full term of pregnancy, wine should be prescribed to her, for that will improve the condition of her uterus, make her happy and alleviate the pain of the operation."¹ Suśruta, however, distinctly lays down that "wine should be used before operation to produce insensibility to pain." He again remarks: "It is desirable that the patient should be fed before being operated on. Those who are addicted to drink and those who cannot bear pain, should be made to drink some strong beverage. The patient, who has been fed, does not faint, and he who is rendered intoxicated, does not feel the pain of the operation."²

The use of certain drugs to produce anæsthetic effects was well known to the ancient Greeks and Romans. Dioscorides

¹ व्यपगतगर्भशब्धानु स्त्रियमामगर्भी सुराशीध्वनरिष्टमधुमदिरासवानामन्यतमस्ये
क्षामव्यतः पाययेत् गर्भकीष्टविग्रहार्थमर्त्तिविकरणाग्रे प्रहर्षार्थञ्च ॥

Caraka Saṁhitā, IV, viii.

² प्राक्शस्त्रकर्त्तव्येष्टं भोजयेदातुरं भिषक् ।
मद्यपं पाययेन्मद्यं तीक्ष्णं योऽवेदनासहः ॥
न मूर्च्छत्यन्नसंयोगान्मत्तः शस्त्रं न बुध्यते ।
तस्मादवश्यं भोज्यं रोगिषूत्तेषु कर्त्तव्यं ॥
प्राचीं क्षाभ्यन्तरी नृणां वाक्प्रमाणसुखान्वितः ।
धारयत्यविरोधेन शरीरं पाञ्चभौतिकं ॥

Suśruta Saṁhitā, I, xvii.

mentions Mandragora. (Mandragora Atropa) to have been employed internally as a hypnotic and anæsthetic. Pliny (82-79 A.D.) in his Natural History mentions that this anæsthetic was also used by inhalation; and this fact is corroborated by Galen, Arætæus, Celsus and others. The Arabian physicians also used it. The Chinese surgeons still use some powder (Indian hemp probably) to throw their patients into profound sleep. In the 13th century Theodoric (died 1298) described the "spongio somnifera" the vapours raised from which were capable, when inhaled, of setting patients into an anæsthetic sleep, thus inducing insensibility to the agony and torture of a surgeon's knife. Baptista also mentions his "Pomum somniferum", to be made with mandragora, opium, &c. The Hindus also inhaled the fumes of burning Indian hemp as an anaesthetic at a period of great antiquity. As early as 927, A. D., they also knew drugs which they employed for the same purpose, for Pandit Vallāla, in his Bhoja Prabandha, alludes to a cranial operation performed on the King Bhoja after he was rendered insensible by some drug called Sammohinī (producer of unconsciousness). Another drug is also mentioned, Sañjibani (restorer to life), by which he soon regained consciousness after the operation had been finished.¹

¹ ततसावपि राजानं मीहचूर्णेन मीहयित्वा शिरःकपालमादाय तत्करोटिकापुटे स्थितं प्रकरकुलं गृहीत्वा कश्चिद्विज्ञाने निक्षिप्य सन्धानकरणया कपालं यथावदारचय्य सञ्जीवनाच्च तं जीवयित्वा तस्यै तद्दर्शयताम् ।

CHAPTER III.

MATERIALS OF INSTRUMENTS.

IRON AND STEEL.

In the R̥gveda, *ayas*, (Latin *aes*), next to gold, is the metal most often referred to. *Ayas* often stands as a generic name to mean simply "metal," though in later works it signifies iron as a rule. The mention of dark and red *ayas* in the Atharvaveda indicates a distinction between iron and copper or bronze. The surgical instruments of the Hindus are recommended generally to be made of iron; but Suśruta allows other suitable material when iron of good quality is not available.¹ He says: "A wise surgeon should get the instruments made of pure iron and with sharp edges by an expert blacksmith who is skilful and experienced in his craft."² The use of impure iron as a material for surgical instruments, he deprecates as a defect and advises the surgeons not to rely on such instruments.

The Hindus were acquainted with steel and they knew how to turn out steel of fine quality from a pure iron ore. Nāgārjuna, the well known Buddhist chemist, wrote a scientific

¹ तानि प्रायशो लौहानि भवन्ति तत्प्रतिरूपकाणि वा तद्वत्तानि ।

Suśruta Saṁhitā. I. vii.

² अस्त्राण्येतानि मतिमान् शुद्धमैक्यायसानि तु ।
कारयेत् करणैः प्राप्तं कर्मारं कर्मकोविदं ॥

Ibid, I, viii.

treatise on steel and iron.¹ Śibodāsa in his commentary on Chakrapāṇi quotes Patañjali as an authority on the subject.² In the Dhanurveda, Viracintāmaṇi, Śāraṅgadharaṇapaddhati and Lohārṇava, steel as a material of sword has been described and classified.

Dr. Mitra quotes some references³ about the knowledge of iron possessed by the ancient Hindus from the R̥gveda. He finds that "swords (II. 156), spears (IV. 25), javelins (II. 292), lances (I. 774), (IV. II. 288) and hatchets (I. 120) are frequently mentioned; and these weapons were bright as "gold" or golden (IV. 19), "shining bright" (I. 175), "blazing" (IV. 93), "sharp" (IV. 113) and "made of iron" (I. 226); they are "whetted on a grind stone" (II. 36) to improve their keenness (I. 150), and "polished to enhance their brightness" (II. 326)....."According to Nearchus, King Porus gave 30 lbs of steel to Alexander as the most precious present he could offer."

Royle also remarks⁴: "Working in metals they have long been famous for: their steel acquired so great celebrity at an

¹ नागार्जुनी मुनीन्द्र शशास यज्ञीहशास्त्रमतिगहनम् ।

तस्यार्थस्य श्रुतये वयनेतद्विशदाचरैर्भूमः ॥

Cakradatta, Rasāyanādhikāra.

² अर्चयित्वा विधानेन हिरण्यं गुरुभास्करौ ।

लीकपालान् यज्ञांश्चैव चेचपालानथीषधम् ।

आदित्यदेवताश्चैव धन्वन्तरौ-पतञ्जली

दद्याद्वलिञ्च सर्व्वेभ्यो नानाभक्षोपचारतः ॥

Quoted in Śibodāsa's commentary on Louhamāraṇa-

Vidhi in Cakradatta.

³ Dr. R. L. Mitra's Indo-Aryans, Vol. I, P. 301. See Wilson's R̥gveda.

⁴ Royle's Antiquity of Hindoo Medicine, Pp. 46-7.

early period, as to have passed into a proverb among the Persians, where *fouladee hind* indicates steel of the best quality; and *jurwabee hind*, an Indian answer, means a cut with a sword made of Indian steel."

COPPER.

Pure copper was also used as a material of instruments; and vessels and instruments of copper are frequently mentioned in the medical books of the Hindus. A copper probe for applying antimony to the eye has been found in the excavations of Bijnor and another in the Bihat excavations. Cakradatta¹ advises us to use a copper probe for the application of *lekhana* collyrium; and suśruta mentions a copper needle in the operation for reclinacion of cataract.²

TIN.

Tin was also used as a material of blunt instruments. Suśruta mentions plates of tin to surround a tumour and to protect the healthy parts, before the application of actual cautery.³ Such plates are recommended to be made of tin, or lead, or copper, or iron.

LEAD.

Tubes of lead were used for purpose of fumigation. Probes made of lead were used for application of collyrium. The use

¹ प्रशस्ता लिखने ताम्बी रोपने कालबीहजा ।

Cakradatta, *Añjanadhikāra*.

² ताम्बायसी शतकौक्षी शलाका स्यादनिन्दिता ।

Suśruta Saṁhitā, VI. xvii.

³ अल्पावशिष्टे कृमिभिः कृते च लिखिततीक्ष्णिं विदधौत पश्चात् ।

यदक्षमूलं त्रपुतामसीस पट्टेः समावेध्य तदायसेव्वा ।

क्षाराग्निशलाख्यं सङ्गद्विदध्यात् प्रानाणहिंसनं भिषग्प्रमत्तः ॥

Suśruta Saṁhitā, IV. xviii.

of lead plates to surround tumours before application of actual cautery has been noted above.

BELL-METAL.

The use of bell-metal—an amalgam of zinc or tin and copper, 25 parts of the former with 75 parts of the latter,—as a material of probes for applying collyrium, is mentioned by Suśruta.¹

GOLD AND SILVER.

Gold was known to the Hindus from the remote antiquity; and among the metals, it is the one most frequently² mentioned in the R̥gveda. Silver was perhaps unknown during the earlier Vedic age, from its name being not mentioned in the R̥gveda. But no conclusion can safely be drawn from this argument³. We find, however, gold, silver, and other precious

¹ सौवर्णं राजतं शङ्खं ताम्रं वैदूर्यकांशजं
आयसानि च धीज्यानि शलाकाश्च यथाक्रमं ॥

Suśruta Samhitā, VI. xviii.

² “निष्कं घोषं”

R̥gveda. 5 Mandala. 19 Sūkta.

“निष्केन सुवर्णेन अलङ्कृता घोषा” ।

Sāyana.

अश्वः न ह्यस्यावान् ।

Ibid. 4 Mandala. 2 Sūkta.

“सुवर्णं निर्मितं कल्यावान् अश्वः” ।

Sāyana.

“A horse with golden caparisons”—Wilson.

³ “एनौ रयि” ।

R̥gveda. 5 Mandala. 33 Sūkta.

एनवर्णा श्वेतवर्णा रयिं घनं ।

Sāyana.

“Query, if silver money be intended”—Wilson.

stones mentioned as materials of instruments in the medical books. Gold and silver vessels and plates are often described in Sanskrit literature.¹ Suśruta mentions the use of drinking cups made of gold, silver and precious stones.²

Caraka, amongst other things necessary for a lying-in-room, mentions two needles of gold and silver.³ To cut the navel-cord of the new-born child, he recommends a knife made of gold, or silver, or iron.⁴ In the *Manusmṛhitā*⁵ we find: "Before the section of the navel string, a ceremony is ordained on the birth of a male; he must be made while sacred texts are pronounced, to taste a little honey and clarified butter from a golden spoon."⁶ A golden needle is mentioned by

- ¹ सुवर्णरूप्यशङ्खाग्रं युक्तिं रत्नं मयानि च ।
कांस्थाय स्नातुं रत्नानि एतसीस मयानि च ।
निर्लेपानि विमुक्तानि केवलेन जलेन तु ॥

इति ब्राह्मे ।

- ² सौवर्णे राजते तावदे कांसि मणिमये तथा
पुष्पावतंसं भीमे वा सुगन्धि सलिलं पिवेत् ॥

Suśruta Saṁhitā, I. xlv.

- ³ * * * तीक्ष्णी सूचीपिप्पलकौ सौवर्णं राजतौ हे शस्त्राणि च तीक्ष्णायसानि ।

Caraka Saṁhitā, IV. viii.

- ⁴ नाभिवन्धनात् प्रवृत्तिं हिलाष्टाङ्गुलमभिज्ञानं कृत्वा ह्येदनावकाशस्य ह्यथीवन्तरयोः
शनेष्टं ह्येता तीक्ष्णेन रौक्मराजसायसानां ह्येदनानामन्यतमेनीर्ध्वारेन ह्येदयेत् ॥

Ibid.

- ⁵ ग्राह्यं नाभिवर्धनायुंसी जातकर्म विधीयते ।
मन्त्रवत्प्राशनं चास्य द्विरप्यमघुसर्पिषाम् ॥

Manusmṛhitā, II. 29.

- ⁶ *Manusmṛhitā* (ch. II. V. 29. Jones's trans.)

Suśruta for pricking the bulb of Soma plant to extract its juice.¹ To cure trichiasis, Cackradatta mentions a needle cautery of gold.² For destroying the hair follicles, he advises us to pass the hot needle into them as soon as the eyelashes are removed by epilation. In the Yogaratnākara, is mentioned a cautery of gold, to burn the fistulous track round the anus.³ Śārṅgadhara mentions silver or coral pots for keeping medicated snuffs,⁴ and gold and silver tubs for immersing patients in medicated lotions.⁵

HORN.

Horns of animals are mentioned as suction-apparatus. For

¹ * * * * सीमकन्दं सुवर्णसूच्यादिविदार्य पयोगृह्णीयात् सौवर्णे
पात्रेऽञ्जलिमात्रं * * * *

Suśruta Samhitā, IV. xxix.

² प्रहृष्टान्त्वर्मुखं रोम सङ्घिणीरुद्धरच्छनैः ।
सन्दंशेनोद्धरेद्व्यां पक्षरोमाणि बुद्धिमान् ।
रक्षन्नचि दहेत् पक्ष तप्तहेमशलाकया ।
पक्षरोगे पुननैव कदाचिद्रोमसम्भवः ॥

Cakradatta, Notraroga Cikitsā.

³ न्यपानमार्गपिटिकां दहेत् स्वर्णशलाकया ।
अग्निप्रतप्तया पश्चात् कुप्यादग्निव्रणक्रियाम् ॥

Yogaratanākara, p. 347.
(Anandāsram Series).

⁴ कोणमच्छिन्नधारञ्च हेमतारादिशक्तिभिः ।
शुक्ला वा पात्रे युक्त्वा वा प्लातैर्व्या नस्यमाचरेत् ॥

Śārṅgadhara Saṁgraha, III. viii.

⁵ सौवर्णं राजतं वापि ताम्रमायसञ्चदारुजं ।
कोष्ठकं तत्र कुर्वीतीच्छाये षठ्चिंशदङ्गुलं ॥

Ibid, III. ii.

this purpose, the horn of a cow is recommended.¹ A probe made of horn is advised to be used for applying collyrium. Suśruta mentions goat's horn to be used as a container of medicine.² He also recommends for this purpose vessels manufactured out of horn.³ Similarly Caraka advises us to keep medicines in the lamb's horn.⁴ Tubes of Vasti-yantra (clysters) are often described to be made of horn.⁵

BONE AND IVORY.

Vāgbhaṭa II describes the aṅguli-trāṇaka or finger-guard to be made either of wood or ivory.⁶

¹ “चूषणे”, विष पूयाद्या चूषण निमित्तं शरीरेषु युज्यते यत्, “शङ्ख” गवादि भवं शुषिरं शङ्ख * * * *

Vāgbhaṭārtha Kaumudī, I. xxv.

² चूर्णाञ्जनं कारयित्वा भाजने मेषशङ्खजे ॥

संस्थाप्योभयतः कालमञ्जयेत् सततं बुधः ।

Suśruta Saṁhitā, VI. xv.

वंशे वा माद्विषे शङ्खे स्थापयेत् शोधितं रसम् ।

Rasendra Cintāmaṇi. IX.

³ एतच्चूर्णाञ्जनं श्रेष्ठं निहितं भाजने शुभे ।

दन्तस्फटिकवैदूर्यं शङ्खशैलासनोद्भवे ।

शतकुम्भेऽथ शङ्खं वा राजते वा सुसंस्कृते ॥

Suśruta Saṁhitā, VI. xix.

⁴ सिद्धः शैलासने भाखे मेषशङ्खे च संस्थितः ॥

Caraka Saṁhitā, VI. xxvi.

⁵ विमुद्रासं त्रिखण्डाञ्च घातुजां काठजां तथा ।

षडङ्गुलीस्यां गोपुच्छां नाडीं युज्यात् द्विहस्तिकां ॥

Śārṅgadhara Saṁgraha, III. ii.

⁶ अङ्गुलि त्राणकं दान्तं वाचं वा चतुराङ्गुलं ।

Aṣṭāṅga Hrdaya. I. XXV.

WOOD.

To apply vapour-bath, Śārīgadharma mentions tubes made of wood or metal.¹ Wooden Tubes for injections were also used.²

STONE.

Śārīgadharma says: "The collyrium probes should be made either of stone or metal".³ For compounding medicines, stone *khal* or mortar and pestles are mentioned. A big stone slab with a muller is recommended to be used for grinding dry or fresh vegetable medicines. In extracting the Soma juice, two slabs of stone are mentioned in the R̥gveda.⁴

EXECUTION.

The execution of the instruments is said to have been all that can be desired. Suśruta says⁵: "They should be made just of the proper size with their ends rough or polished; they should be also strong, well-shaped and capable of a firm grasp." Again he continues: "When an instrument (has been selected) of

¹ नेत्रानि धातुजान्वाङ्मूलं वंशदिजान्वापि ॥

Śārīgadharma Saṁgraha, III. ix.

² नेत्रं कार्यं सुवर्णादिधातुभिश्चक्षुष्यभिः ।

मलैर्हृष्टैर्विषायाद्यैः मन्थिमियां विधीयते ॥

Ibid, III. v.

³ मुखयोः कुण्डिता शस्त्रा शलाकाष्ठाङ्गुलीन्मिता ।

अश्लक्ष्णं धातुजा वा स्यात् कलायपरिमण्डला ॥

Ibid, III. xiii.

⁴ R̥gveda. 10 Mandala, 76, 94 & 175 Suktas.

⁵ समाहितानि यन्त्राणि खरश्लक्ष्णमुखानि च ।

सुदृढानि सुरूपाणि सुवह्नाणि च कारयेत् ॥

Suśruta Saṁhitā, I. vii.

a fine make and with an edge keen enough to divide the hairs on the skin, and when it has been firmly grasped at the proper place, only then it should be used in any surgical operation"¹. And again: "A wise surgeon will get his instruments made of good iron and with sharp edges, by a blacksmith who is skilful and experienced in his craft."² Vāgbhāṭa also gives the same directions.³

ORNAMENTATION.

In the absence of actual specimen, it is impossible to say whether there was any ornamentation on the surgical instruments of the Hindus. No ornamentation is described in the extant medical treatises. Only one instrument—Mucutī—is mentioned by Vāgbhāṭa II as being ornamented with a ring.⁴

EDGES OF SHARP INSTRUMENTS.

Suśruta says⁵: "The edges of instruments, used in incising

¹ यदा मुनिश्चितं शस्त्रं रोमच्छेदि सुसंस्थितं ।

सुगृहीतं प्रमाणेन तदा कर्म्मसु योजयेत् ॥

Ibid, I. viii.

² See foot-note 2, P. 61.

³ षड्विंशतिः सुकर्मारैर्घटितानि यथाविधि ।

शस्त्राणि रोमवाहूनि बाहुल्येनाङ्गुलानि षट् ॥

सुरुपाणि सुधाराणि सुयद्वाणि च कारयेत् ।

अकरालानि सुश्चातमुत्तीक्षावार्त्ततेऽयसि ॥

समाहितसुखायाणि मौलान्मोजच्छवीनि च ।

नामानुगतरूपाणि सदा सन्निहितानि च ॥

Aṣṭāṅga Hr̥daya, I. xxv.

⁴ मुचुटी सूक्ष्मा दन्तजुर्मूले रुचकभूषणा ।

Ibid.

⁵ तत्रधारा भेदनानां मासूरी । लेखनानामर्द्धमासूरी ।

व्यधनानां विस्त्रावणानाञ्च कौशिकी । छेदनानामर्द्धकौशिकीति ॥

Suśruta Saṁhitā, I. viii.

(as of *Vṛddhipatra*, *Nakhaśastra*, &c.) should be of the fineness of a *masūra* (*Ervum Lens*); of those used in scarifying (as *Maṇḍalāgra* &c.) of a half a *masūra*; of those used in puncturing (as *Kuṭhārikā*) and evacuating (as needles, *kuśapatra*, &c.) of a hair; and those used in dividing (as *Vṛddhipatra*), of half a hair". As to the *Vaḍiśa* or hook and the *Dantaśaṅku* or tooth-scalers, the former should have a curved end and a fine point, while the latter should have an end shaped like the first leaf of barley."¹

THE TEMPERING OF SHARP INSTRUMENTS.

Suśruta remarks² that "the instruments are tempered in three ways;—by immersing the heated *śastra* in an alkaline solution, or water, or oil. Those tempered in an alkaline solution are used in dividing bones and in excising arrows and other foreign bodies. Those tempered in water are used in incising, dividing or clearing muscles; and those tempered in oil are used in puncturing veins and dividing nerves and tendons."

As the methods of tempering the *śastras* are the same as those recommended for the arms of war, we quote from *Vṛddha Śārṅgadharma* (the elder), two methods of tempering arrow-heads and swords. He says³: "I shall describe the ways of tempering arrow-heads, by smearing them with a paste of

¹ वडिशो दन्तशङ्कुश्चानतापे तीक्ष्णकण्टकप्रथमं यवपत्रसुखे ।

Suśruta Samhitā, I. viii.

² तेषां पायनां त्रिविधा चारीदकतैलेषु तत्र चारपायितं शरशलाखिच्छेदनेषु ।
उदकपायितम् मांसच्छेदनभेदनपाटनेषु तैलपायितं सिराव्यधनस्त्रायुच्छेदनेषु ।

Ibid.

³ फलस्य पायनं वक्ष्ये वनौषधिरिलिपनेः ।

येन दुर्भेद्यवर्षाणि भेदयेत् तरुपर्णवत् ॥

Vṛddhya Śārṅgadharma,

vegetable drugs, which would thus acquire the power of piercing a coat-of-mail as easily as the leaf of a tree."

I.

"Make a paste of Pippali (Piper Longum), rock-salt and Kuṣṭha (Saussurea Lappa) with cow's urine. These are to be well mixed until the paste becomes cold and yellow. The arrow-heads and other sharp cutting instruments are to be well smeared with that paste and then heated to redness. Then they are to be removed from the furnace and allowed to cool down to a state short of redness and dipped in oil. By this means, the iron acquires special power as a cutting instrument¹".

II.

"Make a paste of the five kinds of salts,² mustard and honey. Let the instrument-maker smear it on the śastras which are then to be heated in a furnace. When the colours resembling those of a peacock's feather are displayed on the śastra, the burning is known to be adequate. The instrument is then dipped in water³".

- ¹ पिप्पली सैखवं कुष्ठं गोमूत्रेण तु पेययेत् ।
 अतिशीतं मनाविद्धं पीतं नष्टं तथौषधम् ॥
 अनेन लेपयेच्छस्त्रं लिप्तं चाग्नौ प्रतापयेत् ।
 ततो निर्ज्वापितं तैले लौहं तत्र विशिष्यते ॥

Vṛddhya Śārṅgadharma.

- ² सौवर्चलं सैन्धवञ्च विङ्गुलीहिमं च ।
 सामुद्रेण सहैतानि पञ्चसुलंबणानि च ॥

Vaidyaka.

- ³ पञ्चभिलंबणैः पिष्टं मधुसिक्तः ससर्षपैः ।
 एभिः प्रलेपयेच्छस्त्रं लिप्तं चाग्नौ प्रतापयेत् ॥
 शिखिशीबानुवर्णानि तप्तपीतं तथौषधं ।
 ततस्तु विमलं तीर्थं पाययेच्छस्त्रमुत्तमम् ॥

Vṛddhya Śārṅgadharma.

III.

The sage Uṣanās or Śukrācāryya thus describes¹ the tempering of swords in the Vṛhat Saṁhitā (Kern's trans. Ch. L.) :—

23. The fluid to imbrue a sword with, according to the precepts of Uṣanās, is: blood, if one wishes for a splendid fortune; ghee, if one is desirous to have a virtuous son; water, if one is longing for inexhaustible wealth.

24. An approved mixture to imbrue the sword with, in case of one desirous to attain his object by wicked means, is: milk from a mare, a camel and an elephant. A mixture of fish bile, deer-milk, horse-milk, and goat-milk, blended with toddy, will make the sword fit to cut an elephant's trunk.

25. A sword first rubbed with oil, and then imbrued with an unguent compounded of the milky juice of the Calotropis, goat's horn, ink, dung from doves and mice, and afterwards whetted, is fit for piercing stone.

-
- ¹ वङ्गवीड्रकरेणुदुग्धपानं
यदिपानेन समीकृतेऽर्थसिद्धिः ।
भाषपिण्डसृग्गाश्च वस्तदुग्धैः
करिङ्गसच्छिद्ये सतालगर्भैः ॥
आर्कं पथी कुङ्कु विषाणमसीसमेतं
पारवतास्तु श्रुता च धृतं प्रलेपः ।
शस्त्रस्य तैलमथितस्य ततोऽस्य पानं
पश्चाच्छित्तस्य न शिलासु भवेद्विधातः ॥
क्षारं कदल्या मथितेन धुत्वा
दिनौषिते पाथितमायसं यत् ।
सम्यक् शितं धास्मनि नेति भङ्गं
न चान्यलौहेष्वपि तस्य कौशल्याम् ॥

26. An instrument imbrued with a stale mixture of potash of plantains with butter milk, and properly whetted, will not get crooked on a stone, nor blunted on other iron instruments.

GOOD AND BAD QUALITIES OF SURGICAL INSTRUMENTS.

Suśruta says¹: "The good points in an instrument are the following: it should have a well-made handle, affording a firm grasp; it should be made of iron of good quality; it should have a fine edge, a pleasant shape and a well-finished point; and it should not be dentated (except the saw)." He gives preference to the Śastras which are of good make and with a fine edge—so fine as to divide the hairs on the skin and whose handles can easily be grasped by the surgeon's hand.

On the other hand, he points out eight defects² of sharp instruments: they must not be bent, or blunt, or broken, or jagged, or too thick, or too thin, or too long, or too short. Instruments free from these defects should be used. The Karapatra or saw is the only exception, for being used for sawing bones, it requires a jagged or dentated edge. Vāgbhaṭa also mentions these defects.³

¹ तानि सुग्रहाणि सुलोहानि सुधारानि सुरूपाणि सुसमाहितमुखामृष्यकरालानि चेति शस्त्रसम्पत् ।

Suśruta Samhitā, I. viii.

² तत्र वक्रं कुण्डं खण्डं खरधारमतिस्थूलमत्यल्पमतिदीर्घमतिऋक्षमित्यष्टौ शस्त्रदोषाः ।
अती विपरीतगुणमाददौतान्यत्र करपत्राच्चि खरधारमस्थिच्छेदनार्थं ।

Ibid.

³ कुण्ड-खण्ड-तनु-स्थूल-ऋक्ष-दीर्घल-वक्रताः ।

शस्त्राणां खरधारत्वमष्टौ दोषाः प्रकीर्तिताः ॥

Aṣṭāṅga Hṛdaya, I. xxvi.

Suśruta enumerates twelve defects¹ of blunt instruments, viz., it may be too thick, or made of impure metal, or too long, or too short, or incapable of being grasped, or capable of being grasped (unevenly) partially, or bent, or made of too soft material, or of elevated ends, or it may have bent, loose, elevated, and weak pins, or be of weak ends, or of thin sides. These faults refer principally to the *Swastika yantras* or the cruciform instruments.

THE USES OF INSTRUMENTS.

Twenty four different kinds of operations² are said to be performed by the blunt instruments (Suśruta), viz.:—

- | | |
|-----------------|---|
| 1. Nirghātana | ... Extraction by moving to and fro. <i>e. g.</i> śalyanirghātana. |
| 2. Pūraṇa ... | ... Filling the bladder or eyes with oil. |
| 3. Bandhana ... | ... Bandaging and binding by rope. |
| 4. Vyūhana ... | ... 1. Raising up and incising a part for removing a thorn or 2. bringing together the lips of the wound. |
| 5. Vartana ... | ... Contracting or curling up. |

¹ तत्रातिस्थूलमसारमतिदीर्घमतिदृक्खनमग्राहि विषमग्राहि वक्रं शिथिलमत्युन्नतं खट्वकीलं खटुमुखं खटुपाशमिति द्वादश यस्मदीषाः ।

Suśruta Samhitā, I. vii.

² यस्मकस्यानितु निघातनपूरणवन्धनव्यूहनवर्तनचालनविवर्तनविवरणपीडनमार्ग-विश्रीघनविकर्षणाद्हरणाद्यनीद्वमनविनमनमञ्जनीमथनाचूषणैषणदारणर्ज्जकरणप्रक्षालनप्रधमन-प्रसारजनानि शतुस्त्रिंशतिः ।

- | | |
|-------------------------|---|
| 6. Calana ... | ... 1. transferring, i.e., removing from one part to another; 2. moving a foreign body. |
| 7. Vivartana ... | ... Turning round. |
| 8. Vivarana ... | ... Exposing or opening out any part. |
| 9. Pīḍana ... | ... Pressing as by finger to let out pus from an abscess. |
| 10. Mārga Viśodhana ... | ... Clearing the canals such as the urethra, rectum &c. |
| 11. Vikarṣaṇa ... | ... 1. Extraction by pulling; or 2. loosening a foreign body fixed in muscles &c. |
| 12. Āharaṇa ... | ... Pulling out. |
| 13. Āñcana ... | ... Pulling up. |
| 14. Unnamana ... | ... Elevating or setting upright as the depressed cranial bones or ears. |
| 15. Vinamana ... | ... Depression as of the elevated ends of the fractured bone. |
| 16. Bhañjana ... | ... 1. Rubbing the head, ears &c.; 2. contusing a part all round before it is surgically operated on. |
| 17. Unmathana ... | ... Probing or stirring the track formed by an impacted foreign body. |
| 18. Ācuṣaṇa ... | ... Suction as of poisoned blood and milk by horns, or gourd, or mouth. |

- | | |
|----------------|---|
| 19. Eṣana ... | ... Exploring as by an earth-worm shaped probe, the direction of a sinus or the existence of a foreign body in the wound. |
| 20. Dāraṇa ... | ... Splitting or dividing as the head, ears &c. |
| 21. Rjukaraṇa | ... Straightening anything which is bent. |
| 22. Prakṣāḷana | ... Washing as a wound with water. |
| 23. Pradhamaṇa | ... Blowing as powders into the nose through tubes. |
| 24. Pramārjana | ... Rubbing out as foreign bodies from the eyes &c. |

Vāgbhaṭa recognises only fifteen different kinds¹ of operations performed by the blunt instruments: Nirghātana (moving to and fro), Unmathana (probing), Pūraṇa (filling up), Mārga Śuddhi (clearing passages), Saṁvyūhana (raising up and extracting a thorn by incision), Āharaṇa (pulling out), Bandhana (bandaging), Piḍana (pressing), Ācūṣaṇa (suction), Unnamana (elevation), Nāmana (depression), Cāla (movement), Bhaṅga (breaking), Vyāvartana (turning round); and Rjukaraṇa (straightening).

¹ निर्वीतनीन्मथन पूरण मार्गशुद्धि
संव्यूहनाद्धरण वन्धन पीडनानि ।
आचूषणीमन नासन चाल भङ्ग
व्यावर्तनर्जकरणानि च यन्त्रकार्ये ॥

The śastras or cutting instruments, on the other hand, are said to perform eight kinds of surgical operations (Suśruta).¹

1. Chedana ... Excision or removal of a part of the body by operation as of piles.

Instruments:—Vṛddhipatra, nakhaśastra, mudrikā, utpalapatra, and arddhadhāra.

2. Bhedana ... Incision of a part, as of an abscess.

Instruments:—The same as above.

3. Lekhana ... Scarification or dissection of a skin-flap; or scraping, as of Rohini i.e., surgical diseases of the throat.

Instruments:—Maṇḍalāgra and karapatra.

4. Vedana or Vyādhana ... Puncturing as of veins to bleed patients by instruments having fine points.

Instruments:—Kuṭhārikā, vṛhimukha, āra, vetaspatra, and sūci.

5. Eṣaṇa ... Probing, as of sinus and fistula by a probe.

Instruments:—Eṣaṇī.

6. Āharana. ... Extraction, as of stone by the spoon or hook.

Instruments:—Vadīśa, and danta-śaṅku.

¹ तच्च शास्त्रकर्मोऽष्टविधं । तद्यथा । छेदः भेदः लेखः वेद्यमेवमाहार्यः विद्याव्यः स्त्रीव्यनिति ।

7. Viśrāvana ... To let out pus as from a deep-seated abscess.

Instruments:—Sūci, kuśapatra, ātimukha, śarārimukha, antarmukha, trikurccaṅga, and eṣaṇī.

8. Sivana ... Stitching, as of the lips of a wound by needles.

Instruments:—The different kinds of sūci or needles.

Caraka mentions, however, six kinds¹ of operations:—

1. Pātana ... Incision, as in operation for sinus, abscess, intestinal injury, and deeply impacted foreign bodies.
2. Vyādhana ... Tapping or piercing, as in operations for ascites, suppurating tumour, ovarion tumour, boils &c.

- ¹ पाटनं व्यधनञ्चैव क्लेदनं लेपनं तथा ।
 प्रोक्कनं सौवनञ्चैव षड्विधं शस्त्रकार्यं तत् ॥
 नाडीत्रिणाः पक्ष्मश्रीयास्तथा क्षतगुदीदरम् ।
 अन्तःशल्याश्च ये देशाः पाक्ष्मास्ते तद्विधाश्च ये ॥
 दन्तीदराणि संपक्ता गुल्माः ये ये च रक्तजाः ।
 व्यध्याः शीघ्रितरीगाश्च वीसर्पपिङ्गकादयः ॥
 छद्मघ्नान् स्थूलपथ्यन्तामुत्सन्नान् कठिमान् व्रणान् ।
 अश्रः प्रसृत्यधीमांसं क्लेदनेनोपपादयेत् ॥
 किलासानि मुकुष्ठानि लिखेह्लेष्ठानि बुद्धिमान् ॥
 वातासृग्मथमपिङ्गकाः सकोटा रक्तमण्डलाः ।
 कुष्ठान्यभिहित्वाश्च शीघ्रांश्च प्रच्छेदयेद्विषक् ॥
 सौम्यं क्षुब्धुदराद्यन्तु गम्भीरं यद्विपाटितं ।
 इति षड्विधमुद्दिष्टं शस्त्रकार्यं मनोविभिः ॥

3. Chedana ... Excision, as in the operation for tumours, raised and thickened *vraṇa* or corns, and piles.
4. Lekhana ... Scraping, as in operation for some varieties of skin diseases.
5. Pracchana ... Scarifying, as in the operations for glands, boils, leprous nodules, inflammatory swellings, &c.
6. Sībana ... Sewing, as in the operation of laparotomy for deep seated diseases in the abdomen.

Vāgbhaṭa describes thirteen kinds¹ of operations performed by the sharp instruments :—

1. Utpātana ... Raising up by incision, as by the Nakhaśastra.
2. Pātana ... Incision as by the Vṛddhipatra.
3. Sīvana ... Stitching as by the Sūci.
4. Eṣaṇa ... Probing as by the Eṣaṇī.
5. Lekhana ... Scraping as by the Maṇḍalāgra.
6. Pracchana ... Scarification as by the Maṇḍalāgra.
7. Kuṭṭana ... Pricking as by the Sūci in tattooing.
8. Chedana ... Excision as by the Vṛddhipatra.

¹ उत्पाद्य पाद्य सौव्यैष-लेख्य-प्रच्छन्न कुट्टनम् ।

क्षेयं मेयं व्यथो मम्यो यद्वा दाहश्च तत्क्षियाः ॥

Aṣṭāṅga Hṛdaya, I. xxvi.

- | | | |
|--------------|-----|---------------------------------|
| 9. Bhedana | ... | Piercing as by the Sharp Eṣaṇī. |
| 10. Vyadhana | ... | Tapping as by the Vetasapatra. |
| 11. Manthana | ... | Churning as by the Khaja. |
| 12. Grahana | ... | Fixing as by the Sandamśa. |
| 13. Dahana | ... | Burning as by the rods. |

WHETSTONE.

In the R̥gveda we find the use of stones mentioned for whetting the edges of the arms of war.¹ The Hindu surgeons used a stone slab for sharpening the śastras or edged instruments.² It was of the colour of māṣa (Phaseolus Roxb.). The whetstones used by the Greeks and Romans were either the marble ointment slabs, or made of clay slate or sandy schistaceous shale.

INSTRUMENT CASES.

To preserve the edges of the cutting instruments, a case made of the wood of salmālī (Bombax Malabaricum) was used (Suśruta).³ Such cases were also manufactured of canvas, or wool, or silk, or leather. These cases—twelve *aṅguli* (i.e. fingers' breadth) long and nine *aṅguli* broad—were well sewn and

¹ See R̥gveda, Mandala. 2 Śukta. 39 Verse 7.

„ 9 „ 90 „ 1.

„ 9 „ 112 „ 2.

„ 10 „ 53 „ 9.

„ 19 „ 101 „ 2.

² तेषां निशानार्थं श्वच्छशिला भाषवर्णा ।

Suśruta Saṁhitā, I. viii.

³ धारसंस्थापनार्थं शाल्मली फलकमिति ।

consisted of compartments, lined with wool and separated by partitions for each instrument. They could be folded, closed with a rod and firmly tied by a knot.¹ The barbers of India still use similar cases for their instruments.

That the razor used to be kept in a case, we know from a passage in the Vṛhadāranyaka (800 to 500 B. C.) where the author says "It (the Atman) is here all-pervading down to the tips of the nail. One does not see it any more than a razor hidden in its case or fire in its receptacle".²

¹ स्यान्नाङ्गुलि विस्तारः सुघनी द्वादशाङ्गुलः ।
 चौम पट्टीर्णं कौषेय दुकूलं सुदु चर्मजः ॥
 विन्यस्त पात्रः सुस्यूतः सान्त्तरीर्णस्थः शस्त्रकः ।
 शलाका पिहितस्य च शस्त्रकोषः सुसञ्चयः ॥

Aṣṭāṅga Hṛdaya, I. xxvi.

अथ शस्त्राणां सुरक्षार्थं शस्त्रकोष माह स्यादित्यादि । नवाङ्गुलिविस्तारः नवाङ्गुल परिमाणविस्तारविशिष्टः शस्त्रकोषः स्यात् । शस्त्रस्य कोषः शस्त्रकोषः । कोष चाप् इति लोके । यथा अस्त्रकोष इत्यादि । तथा सुष्टु, घनो, निविडः सुघनः तथा द्वादशाङ्गुलः दैर्घ्येण द्वादशाङ्गुल परिमाणः, तथा चौमादिजः । तथा विन्यस्तः यथा क्रमेण कृतः पात्रो यस्य स विन्यस्तपात्रः । तथा सुष्टु, स्यूतः कृत सेवनः, सुस्यूतः तथा सान्त्तराणि सव्यवधानानि, कर्णास्थानि मेधादिलोममध्येस्थितानि, शस्त्राणि यस्मिन् स सान्त्तरीर्णस्थशस्त्रकः । तथा शलाकायाः पिहितं स्थागतं आस्यं मुखं यस्य स शलाकापिहितस्य तथा सुष्टु सञ्चयो, नापित भाण्डिकवद्वाशीकरणं यस्य स सुसञ्चयः । चौमं अतसीसूतभववस्त्रं केन्विस् ख्यातः । दुकूलशब्दः पट्टादिभिः स्त्रिभिः सम्बध्यते । तेन पट्टदुकूलं पाट् इति ख्यातेन सूत्रेण निर्मितं वस्त्रं जर्ना, मेधादिलोम तद्वत् वस्त्रं और्णं दुकूलवनात् इत्याख्य वस्त्रादि । कौषेयदुकूलं कोषकार-कोटभवं सूत्रेण रेश्म इति ख्यातेन निर्मितं वस्त्रं ।

Vāgbhaṭārtha Kaumudī.

² Vṛhadāranyaka, I. iv.

Macdonell's Sānskrit Literature, p. 22.

To prove that portable cases for medicaments and instruments were in use in ancient India, we quote *in toto* from the *Mohāvāgga* some references to them.¹

BOXES FOR OINTMENTS, OINTMENT POTS, AND
PORTABLE CASES.

Now at that time, the Bhikkhus used to put pulverised ointments into pots and saucers. They became sprinkled over with herb-powder and dust.

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of a box for ointment".

Now at that time the *Khabbaggiya* Bhikkhus used to carry about various kinds of boxes for ointments—gold ones and silver ones. People were annoyed, murmured and became angry, saying, "Like those who still live in the world."

They told this thing to the Blessed One.

"Various kinds of boxes for ointments, gold ones, and silver ones, are not, O Bhikkhus, to be used. Whosoever does so, is guilty of a *dukkata* offence. I allow, O Bhikkhus, the use of such boxes made of bone, or ivory, or horn, or of the *naḷa* reed, or of *bambu*, or of wood, or of lac, or of the shells of fruit, or of bronze, or of the centre of the chank-shell (*Sankhu-navi*)."

2. Now at that time the boxes of ointment had no lid. (The ointment) was sprinkled over with herb-powder and dust.

They told this thing to the Blessed One.

¹ *Mohāvāgga* vl. 12. (Sacred Books of the East).

"I allow you, O Bhikkhus, the use of a lid."

The lid used to fall off.

"I allow, O Bhikkhus, to fasten the lid with thread and tie it on to the box."

The boxes used to fall.

"I allow you, O Bhikkhus, to sew the boxes on with thread".

3. Now at that time the Bhikkhus used to rub ointment on with their fingers, and the eyes were hurt.

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of a stick or holder to put the ointment on with".

Now at that time the *Khabbaggiya* Bhikkhus used to keep various kinds of ointment-sticks—gold ones, and silver ones. People were annoyed, murmured, and became angry, saying, "Like those who still live in the world".

They told this thing to the Blessed One.

"Various kinds of ointment-holders, O Bhikkhus, are not to be used. Whosoever does so, is guilty of a *dukkata* offence. I allow, O Bhikkhus, the use of ointment-holders of bone, or of ivory, or of horn, or of the *naḷa* reed, or of bambu, or of wood, or of lac, or of fruit, or of bronze, or of the chank-shell."

4. Now at that time the ointment-sticks used to fall on the ground and become rough.

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of a case for the ointment-sticks".

Now at that time the Bhikkhus used to carry the ointment-boxes and ointment-sticks about in their hands.

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of a bag to put the ointment-box in."

They had no shoulder strap.

"I allow you, O Bhikkhus, the use of a shoulder strap (by which to carry the ointment-box), or of a thread (by which to sew or tie it on)."

13.

1. Now at that time the venerable *Pilindavakkha* had head-ache.

"I allow, O Bhikkhus, the use of a little oil on the head".

(The disease) became no better.

"I allow, O Bhikkhus, the practice of taking up (medicine) through the nose". (See commentary on the *Dhammapada*, pp. 83.)

The nose ran.

"I allow, O Bhikkhus, the use of a nose-spoon" (*Natthukarāṇī*).

Now at that time the *Khabbaggiya* Bhikkhus had various kinds of nose-spoons—made of gold, and of silver. People were annoyed, murmured, and became angry, saying, "Like those who still live in the world."

They told this thing to the Blessed One.

"Various kinds of nose-spoons, O Bhikkhus, are not to be used. Whosoever does so, is guilty of dukkata offence. I allow, O Bhikkhus, the use of such nose-spoons made of bone, (&c., as in chap. 12, 1, down to :) the chank-shell.

2. The nose took up the medicament in unequal proportions.

"I allow, O Bhikkhus, the use of a double nose-spoon (yamaka-natthu-karaṇī)."

They used to spread the drugs on a wick before they sniffed up the aroma: and their throats got burnt.

'I allow, O Bhikkhus, the use of a pipe to conduct the aroma.'

Now at that time the Khabbaggiya Bhikkhus had various kinds of pipes (&c., as in the last clauses of § 1, down to the end).

Now at that time the aroma-pipes came open: and worms got in.

'I allow, O Bhikkhus, the use of a lid to the pipes.'

Now at that time the Bhikkhus carried the pipes about in their hands.

'I allow, O Bhikkhus, the use of a bag to carry the aroma-pipes in.'

The aroma-pipes rubbed against one another.

'I allow, O Bhikkhus, the use of a double bag.'

They had no shoulder strap.

'I allow, O Bhikkhus, the use of a shoulder strap (by which to carry the double bag), or of a thread (by which to sew it on)

OPERATION TABLE.

In the examination for piles, Suśruta directs the patient to lie down on his bed or on a board¹; and in describing the operation, Vāgbhāṭa II mentions a board to be used as an operation-table.² A similar bed, as long as the distance from the top of the head to the knees of the patient, is also mentioned in the description of the lithotomy operation.³ The use of a board as a fracture bed is also advised.

For passing the tubes of the *vasti-yantra* or clysters into the urethra in the male, the patient is recommended to sit on a stool as high as his knees (*jānumātrāsana*).⁴

In phlebotomy, the patient is advised to sit on a stool, an aratni high⁵ (i.e. the distance between the tip of the olecranon process of the ulna to the tip of the little finger).

¹ भुक्तवन्तमुपवेश्य सन्धुते शुचौ देशे साधारणे व्यथे काले समे फलेने शय्यायां वा प्रत्यादित्य-
शुद्धमन्वस्योत्सर्गं निषण्णपूर्वकायमुत्थानं * * * *

Suśruta Saṁhitā, IV. vi.

² शुचिं कृतस्वस्थ्यनं भुक्तविष्णुवमव्ययम् ।

शयने फलेने वान्यनरोत्सर्गं व्यापयितम् ॥

Aṣṭāṅga Hṛdaya, VI. viii.

³ ततो बलवन्तमविकृतवमाजानुसमे फलेने प्रागुपवेश्य पुरषश्च तस्योत्सर्गं निषण्णपूर्वकाय-
मुत्थानमुन्नतकटीकं ।

Suśruta Saṁhitā, IV. vii.

⁴ खातस्य भूक्तभक्तस्य रसेन पयसापि वा ।

शुद्धविष्णुवमव्ययस्य पीठे जानुसमे चट्टौ ॥

Caraka Saṁhitā, VIII. ix.

⁵ तच्च व्यथसिरं पुरुषं प्रत्यादित्यमुखमरन्निमान्नीक्षिते उपवेश्यासने ।

Suśruta Saṁhitā, III. viii.

अग्नितापातपङ्क्तिर्नो जानूश्चासनसंस्थितः ।

चट्टपद्मात्रकेयान्को जानुस्थापितकर्पूरः ॥

Aṣṭāṅga Hṛdaya, I. xxvii.

KAPĀTA-SĀYANA OR FRACTURE-BED.

in the treatment of fractures of the lower extremities, a bed is made of the *kapāta-sāyana* (lit. door-bed) or door-bed, consisting of a plank of wood resembling the panel of a door.¹ The patient is to lie down on it. The board has five rods fixed to it, to which the fractured limb is tied to prevent any movement: two on each side of the joint and one on the plantar surface of the foot. Dallāṇa explains it thus²: In fractures of the bones of the leg, two rods are fixed on each side of the ankle and one supports the foot; in fracture of the thigh bone, two rods are fixed on each side of the knee or hip, and one under the foot. In a double fracture of the thigh bone and bones of the

¹ अथ जङ्गीरुभग्नानां कपाटशयनं हितं ।

कौलका बन्धनार्थं च पञ्च कार्या विजानता ।

यथा न चलनं तस्य भग्नस्य क्रियते तथा ।

सन्धेरुभयतौ द्वौ द्वौ तले चैकश्च कौलकः ।

श्रीष्ठां वा पृष्ठवंशे वा बन्धस्य च कथोक्तथा ।

भग्नसन्धिविनीचेषु विधिमेनं समाचरेत् ॥

Suśruta Saṁhitā, IV. iii.

² जङ्गीरुभङ्गेषु पश्चात् कर्म्मविशेषं निर्दिष्टमाह । अथ जङ्गीरुभग्न-
तत्सितमाह । भग्नानाम् काण्डभग्नानाम् । विविधानामपीत्यपरे । कपाटशयनमवश्यं
म् । चलनम् कपाट शयनेनैव सह देशान्तरगमनार्थम् । आधारभूतशयनचालनार्थ-
मे । आधेयभूतशरीरावयवचलन परिहारार्थं कौलाः । कौलानां पञ्चसंख्यालम् ।
वर्द्धयोरेकतरस्य भग्नमवेक्ष्य तत्र जङ्गाभग्नं तु गुल्फसन्धेरुभयतौ द्वौ एकश्च तले एवं पञ्च ।
भग्नं जातुसन्धेरुभयतौ द्वौ द्वौ । वङ्गासन्धेरुभयतस्तले चैक इत्यत्रापि पञ्च । उभयभङ्गा-
त्तु सप्तभिरेव कौलैर्यन्त्रणम् । तथाह उभयतौ बहिर्द्वौ गुल्फयोर्द्वौ च जातुनोः द्वौ च
पृथोः तले चैक एवं सप्त । अत्र जङ्गीर्व्योः पार्श्वयोर्व्यौ द्वौ तले चैकश्च कौलक इति केचित्
त । तन्निबन्धकारैर्न पठितम् । तस्मान्न पठनीयम् । गयदासश्चात्र पाठान्तरं क्रियति
ते । तच्चाभावात् लिखितम् ।

Dallāṇa's Commentary, IV. iii.

leg, seven rods are required,—two on the outer side of the ankle, knee, and groin, respectively, and one under the foot. The fracture-bed is recommended to be similarly availed of in fractures and dislocations of the loin, the spinal column, the chest, and the clavicle. And this mode of treatment, he adds, may advantageously be used for the other kinds of fractures and dislocations. Vāgbhaṭa II also mentions it in the treatment of fractures¹.

Hippocrates used a similar fracture-bed for the proper treatment of fractures and dislocations. It was called Scammum Hippocraticum or bench of Hippocrates. As the figures of this bench would elucidate the structure of the *kapāta-sayana*, we reproduce here three plates with their explanations given at the end of Vol. II, Genuine Works of Hippocrates (Syed. Soc. Ed.), and two plates—Scammum Hippocratis and Plinthium Nilcii from the Collection De chirurgiens Grecs.

Fig. 1. The Scammum Hippocratis or Bench of Hippocrates, as represented by Andreas a Cruce (*Officina chirurgica venetina*, 1596).

Fig. 2. The same as represented by M. Littré.

A. A board, 6 cubits long, 2 broad and 12 inches thick ; not 13 as incorrectly stated by M. Littré.

B. The feet of the Axles, which are short.

कटो जङ्घीरुभगानां कपाटशयनं दितम् ।
यन्मथार्यं तथा कीलाः पञ्च कार्य्या विवन्धनाः ॥
जङ्घीरुभिः पार्श्वयोर्द्वौ द्वौ तल एकस्य कीलकः ।
शोथ्या वा पृष्ठवंशे वा वक्रस्याक्षकयोस्तथा ॥

CC. Axle-trees.

DD. Grooves 3 inches deep, 3 broad, separated from one another by 4 inches.

E. A small post *or* pillar, fastened in the middle of the machine in a quadrangular hole.

F. Pillars a foot long.

G. A cross-beam laid on the pillars FF, which can be placed at different heights by means of holes in the pillars.

Fig. 3. Representation of the mode of reducing dislocation of the thigh outwards, as given by M. Littré (*Œuv. d'Hipp.*, tom. iv, p. 305).

A mistake in the figure given by M. Littré is here corrected.

A. A lever applied to the nates of the luxated side, and acting from without inwards, in order to bring the head of the bone into its cavity.

B. Another lever, held by an assistant, put into one of the grooves of the machine, and intended to act against lever A.

C. Groove in which the end of the lever A takes its point of support.

D. The luxated member.

EE. Extension and counter-extension.

Fig. 4. Banc d'Hippocrate, d'après Rufus, servant à réduire différentes luxations. (Collection De Chirurgiens Grecs, Bibliothèque Nationale).

Fig. 5. Plinthium, ou cadre de Nileus, d'après Héliodore. (Ibid).

CHAPTER IV.

THE NUMBER OF SURGICAL INSTRUMENTS.

The armamentarium of the Hindu surgeons consisted of a good number of surgical instruments. They are described to be of two kinds, the *yantras* and the *śāstras*, i.e., the blunt and the sharp instruments. Suśruta enumerates no less than one hundred and one varieties of the blunt instruments, and twenty different kinds of sharp instruments. Hārīta, on the other hand, enumerates twelve blunt instruments, twelve sharp instruments, and four prabandhas, as necessary for the operation of extraction of arrows and other foreign bodies.¹ Vāgbhaṭa II mentions one hundred and fifteen kinds of blunt and twenty-six kinds of sharp instruments. Pālakapya (Treatment of Elephants) mentions ten kinds of *śāstras* or sharp instruments though he describes the uses of other instruments required for the surgical treatment of diseases.

INSTRUMENTS AND THEIR CLASSIFICATION (SUŚRUTA.)

Of the one hundred and one varieties of the blunt instruments, the surgeon's hand is rightly considered as the principal instrument, for without its help, no instrument can properly be used, and every surgical operation is under its control.² They are recommended to be used for the extraction

¹ दादशैव तु यन्त्राणि शस्त्राणि दादशैव तु ।

चत्वारि च प्रवन्तानां शस्त्रीङ्गारि विनिर्दिशेत् ॥

² यन्त्रशतमेकीक्षरमद्वयमेव प्रधानतमं यन्त्राणामवगच्छ । किं कारणं । यन्त्राणां सादृते यन्त्राणामप्रवृत्तिरेव तदधीनत्वायन्त्रकार्येषां ।

तत्र मनःशरीरावायककाराणि शल्यानि तेषामाहरणीयाणी यन्त्राणि ।

of *śalya* or foreign bodies, *e.g.*, a dart, an arrow, a javelin, a spear, a peg, a pin, a bamboo rod, a stake &c. which cause pain to the body and mind.

A. Suśrūta subdivides the blunt instruments into six classes,¹ viz.:

I. Svastika or cruciform instruments	...	24 kinds.
II. Sandamśa or pincher-like	...	2 "
III. Tāla or picklock-like	...	2 "
IV. Nāḍi or tubular or hollow	...	20 "
V. Śalākā or rod or pricker-like	...	28 "
VI. Upayantra or accessory	...	25 "

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These instruments are advised to be made generally of iron, or of other suitable materials, when iron is not available. Their ends often resemble the faces of some ferocious beasts, or of deers, or birds. Hence the instruments should be so constructed as to have the likeness of their faces, following at the same time the directions of scientific treatises, or the instructions of teachers, or in imitation of other instruments, or in adaptation to the exigencies of the time. They should be of reasonable

¹ तानि षट्प्रकाराणि । तद्यथा । खलिकयन्त्राणि । सन्दंशयन्त्राणि । तालयन्त्राणि । नाडीयन्त्राणि । शलाकायन्त्राणि । उपयन्त्राणि चेति । तत्र चतुर्विंशति खलिकयन्त्राणि । द्वे सन्दंशयन्त्रे । द्वे एव तालयन्त्रे । दिंशतिर्नाशः । षट्विंशतिः शलाकाः । पञ्चविंशति रूपयन्त्राणि ।

Suśruta Samhitā, I. vii.

Hessler translates the terms as follows: *Uncinata instrumenta*, *forcipum instrumenta*, *palmiformia instrumenta*, *hamata instrumenta*, *secundaria instrumenta*,

Hessler's Suśruta, I. vii.

size, with their ends rough or smooth as required. They should be of strong make, good shape and capable of a firm grasp.¹

I. The Svastika or Cruciform instruments are—

1. Siṃhamukha. 2. Vyāghramukha. 3. Vṛkamukha.
4. Tarakṣumukha. 5. Rkṣamukha. 6. Dvīpimukha.
7. Mārjāramukha. 8. Śṛgālamukha. 9. Airvīrūkamukha.
10. Kākamukha. 11. Kaṅkamukha. 12. Kurāramukha.
13. Cāsamukha. 14. Bhāsamukha. 15. Śaśaghātīmukha.
16. Ulūkamukha. 17. Cillimukha. 18. Gṛdhramukha.
19. Śyenamukha. 20. Krauñcamukha. 21. Bhṛṅgarājamukha.
22. Aṅjalikarṇamukha. 23. Avabhañjanamukha, and
24. Nandimukhamukha.

II. The Sandamśa or pincher-like instruments are—

1. Forceps with arms.
2. Forceps without arms.

¹ तानि प्रायशी लौहानि भवन्ति तत्प्रतिरूपकाणि वा तदलाभे । तत्र नानाप्रकाराणां व्यालानां मृगपक्षिणां मुखेमुखानि यन्त्राणां प्रायशः सदृशानि तस्मात्तत्सारूप्यादागमादुपदेशादन्यथदर्शनादुपलब्धत्वात् कारयेत् ।

समाहितानि यन्त्राणि खरश्मच्छुखानि च ।

सदृशानि सुरुपाणि सुग्रहाणि च कारयेत् ॥

Suśruta Saṁhitā, I. vii.

अनेकरूपकार्याणि यन्त्राणि विविधान्यतः ।

विकल्प्य कल्पयेद् बुद्ध्या यथास्थूलान्तु वक्ष्यते ॥

* * * * *

अलौहान्यनुशस्त्याणि तान्येवञ्च विकल्पयेत् ।

अपराण्यापि यन्त्रादीन्यपयोगञ्च यौगिकम् ॥

Aṣṭāṅga Hṛdaya, I. xxy.

III. The Tala or picklock-like instruments are—

1. Ekataḷa.
2. Dwitaḷa.

IV. The Nāḍi or tubular instruments are—

For fistula-iṅ-ano ... (1) with one slit; (2) with 2 slits ...	2
For piles ... (1) with one slit; (2) with 2 slits ...	2
For wounds	1
For clysters (Rectal) ... (Some authors describe 3 only) ...	4
For clysters (vaginal and urethral)... (male and female) ...	3
For Hydrocele	1
For Ascites	1
For fumigation and inhalation ...	3
For Urethral Stricture	1
For Rectal „	1
For Cupping—gourd	1
	<hr/>
	20

V. The Śalākā or rod-shaped instruments are—

Gaṇḍūpadamukha or earth-worm like ...	2
Śarapuṅkhamukha or arrow-stem like ...	2
Sarpafāṇamukha or snake's hood like ...	2
Vaḍiśamukha or fish-hook like ...	2
Masūrādalamukha or masūra pulse like ...	2
Promāṛjana or swabs	6
Khallamukha or spoons	3
Jāmvavavadana or jambul seed like ...	3
Aṅkuśavadana or goad like	3
Kolāsthidalamukha or plum seed like ...	1
Mukulāgra or bud shaped	1
Mālatīpuṣpavṛntāgra or like the stem of mālatī flower	1
	<hr/>

VI. The Upayantra or accessory instruments are—

1. Rajju—thread. 2. Veṇikā—twine. 3. Paṭṭa—bandages.
4. Carma—leather. 5. Valkalā—bark of trees. 6. Latā—creepers.
7. Vastra—cloth. 8. Aṣṭhīlāśma—stone or pebble.
9. Mudgara—hammer. 10. Pāṇipādātala—palm of the hand and sole of the foot.
11. Aṅguli—finger. 12. Jihvā—tongue. 13. Danta—tooth.
14. Nakha—nail. 15. Mukha—mouth. 16. Vāla—hair.
17. Aśvakatāka—the ring of a horse's bridle. 18. Śākhā—branch of a tree.
19. Sṭhivana—spittle. 20. Pravāhana—fluxing the patient.
21. Harṣa—objects exciting happiness. 22. Ayaṣkānta—a loadstone.
23. Kṣāra—caustic. 24. Agni—fire. 25. Bheṣaja—medicines.

B. The sharp instruments or śastras are—

1. Maṇḍalāgra or round headed knife.
2. Karapatra or saw (*lit.* like the human hand).
3. Vṛddhipatra (*lit.* like the leaf of vṛddhi—an unknown medicinal plant)—a razor.
4. Nakha-śastra or nail-parer.
5. Mudrikā or finger-knife (like the last phalanx of the index finger).
6. Utpalapatra, a knife, *i.e.*, resembling the petal of a blue lotus, (*Nymphaea stellata*, Willd).
7. Arddhadhāra or a single-edged knife.
8. Sūci—needles.
9. Kuśapatra—a knife shaped like the kuśa grass (*Eragrostis Cynosuroides*).

10. Ātimukha—a knife shaped like the beak of the Āti
• bird (Turdus Ginginianus).
11. Śararī-mukha—a pair of scissors like the beaks of
Śararī bird.
12. Antarmukha (*lit.* having internal sharp edge)—a kind
of scissors.
13. Trikurecaka—an instrument consisting of three needles.
14. Kuṭhārikā—a small axe shaped instrument.
15. Vrihimukha—a trocar shaped like a grain of rice.
16. Arā or awl.
17. Vetasa-patraka—an instrument shaped like the leaf of a
rattan (Calamus Rotang).
18. Vaḍiśa—an instrument shaped like the fish-hook.
19. Dantaśaṅku or tooth-pick.
20. Eṣani or sharp probe-like instrument.

According to Hārīta¹ the twelve blunt instruments are—

1. Godhāmukha or iguana-faced. 2. Vajramukha—gr̥dhra-
mukha? 3. Tribaktra or three faced. 4. Sandamśa or pincher.

¹ गोधामुखं वज्रमुखं चिवक्त्रं नाम सन्दंश्चक्राज्जातिकङ्कपादम् ।

अथानकं शङ्खककुल्लख श्रीवत्ससीवत्सिक पञ्चवक्त्रं ।

द्वादशैतानि यन्त्राणि कथितानि भिषग्वरैः ।

अथ शस्त्राणि प्रोक्तानि नामानि च पृथक् पृथक् ।

अर्धचन्द्रं व्रीहिमुखम् कङ्कपञ्चं कुठारिका ।

करवीरकपञ्च शलाककरपदकम् ।

वङ्गिर्गृध्रपादश्च शूलौ च सूचिसुद्धरम् ।

शस्त्राख्यैतानि प्रोक्तानि शल्योद्धारैः पृथक् पृथक् ॥

5. Cakrākṛti or circular shaped. 6. Anaka? 7. Kaṅkapāda?
 8. Śrṅga or horn. 9. Kundala? 10. Śribatsa? 11. Saṅbatsika?
 12. Pañcabaktram, i.e., five faced—siraḥamukham?

The twelve sharp instruments of Hārīta are—

1. Arddhacandra or half-moon shaped. 2. Vrihimukha.
 3. Kaṅkapatra. 4. Kuṭhārikā. 5. Karavīrakapatraka. 6. Śalākā
 or sharp probe. 7. Karapatraka or saw. 8. Vajṛīśa or sharp
 hook. 9. Gṛdhrapāda? 10. Śūlī 11. Sūci or needle. 12. Mud-
 gara or hammer?

Vāgbhaṭa II classifies the instruments in the following way :-

A. Blunt instruments—

I. Svastika, as heron, lion, bear, crow, deer

forceps &c. ... 24

II. Sandamśa: It consists of two iron
 blades soldered at one end, the other
 ends being free ... 2

(a) for extraction of eyelashes &c. ... 1

(b) mucuṭī ... 1

III. Tāla ... 2

(a) Ekatāla ... 1

(b) Dvītāla ... 1

IV. Nāḍī or tubular: ... 23

(a) Kaṇṭhaśalyāvalokini or throat speculum
 having three and five holes ... 2

(b) Śalyanirghātani ... 1

(c) For piles, different sizes for male and
 female ... 6

For inspection: 2 holes—rectal speculum 2

For medication: 1 hole ... 2

For applying pressure: entire—śāmi ... 2

(d) For fistula-in-ano: with one and two holes	2
(e) For nasal polypus &c. ...	1
(f) Aṅguli-trāṇaka or finger-guard ...	1
(g) Joni-vrāṇekṣaṇa or vaginal speculum ...	1
(h) Vrāṇo vasti or wound syringe ...	1
(i) For dakodara or Paracentesis abdominis	1
(j) Vastiyāntra or clysters: rectal, vaginal and urethral ...	3
(k) For fumigation... ..	1
(l) Cupping instruments: Alābu, Ghaṭīyāntra and Horns ...	3
	—
	23

V. Śalākā or rod-like instruments ... 34

(a) Gaṇḍūpadamukha or earth-worm shaped	2
(b) Masūradalabaktra ...	2
(c) Śaṅku ...	9
Faṇībaktra or snake's hood ...	2
Śarapūṅkamukha ...	2
Vāḍiśa or blunt hook ...	2
Garvaśaṅku or delivery hook ...	1
Aśmarī or lithotomy hook ...	1
Śarapūṅkamukha or tooth extractor ...	1
(d) For wiping out discharges ...	6
For rectum ...	2
For nose ...	2
For ears (karnaśodhana) ...	2
(e) For application of actual and potential cauteries ...	11
Jāmboubouṣṭha, three for each ...	6

Arddhendu or half-moon shaped, for hernia	1	
Kolāsthidāḥ for nasal polypus	1	
Nail-shaped	3	
(f) For cleansing	3	
Rectum	1	
Vagina	1	
Urethra	1	
(g) Collyrium probe	1	
	<hr/>	
	34	

VI. Anuyantra or accessory instruments are nineteen in number. To the list of Sūsruta he adds the following¹ :—

Goat's gut, silk, time, suppuration, and fear.

B. The sharp instruments of Vāgbhāṭa are twenty-six in number.²

1. Mandalāgra. 2. Vṛddhipatra. 3. Utpalapatra. 4. Adhyar-ddhadhāra. 5. Sarpāsya. 6. Eṣaṇī:—Gaṇḍūpadamukhā and Sūcī-mukhā. 7. Vetasa. 8. Śārārī. 9. Trikurccaka. 10. Kuśapatra. 11. Ātīvadana. 12. Antarmukha and Arddhacandrāṇa. 13. Vrihibaktra. 14. Kuṭhārī. 15. Kuravakasālā. 16. Aṅgulī-sastra. 17. Vaḍīśa. 18. Karapatra. 19. Kartārī. 20. Nakhaśastra. 21. Dantalekhana. 22. Sūcī. 23. Kurcca. 24. Khaja. 25. Ārḍ. 26. Karnavedhanī.

¹ अनुयन्त्राण्यस्तान् रज्जु वस्त्राश्च सुहृताः ।
पद्मान् जिह्वा वालाश्च शाखा नख सुख द्विजाः ॥
काष्ठः पाकः करः पादोभयं हृष्यं तत् क्रियाः ।
उपायवित् प्रविभजेदालोच्य निपुणे धिया ॥

Aṣṭāṅga Hṛdaya. I. xxv.

² षड्विंशतिः सुकर्मारैर्घटितानि यथाविधि ।
शस्त्राणि रोमवाहूनि बाहुल्येनाङ्गुलानि षट् ॥
सुरूपानि सुधाराणि सुग्रहाणि च कारयेत् ।
शकरीलानि सुधृत सुतीक्ष्णावाचंतेऽयसि ॥

Ibid. I. xxvi.

Bhāvamīśra mentions the following blunt and sharp instruments: Eṣaṇī, Jāmvoustha Śālā,¹ Sūci² and knives generally in making incisions which should be shaped like Kharjjūrapatrika, (like the leaf of Kharjjūra tree, Phoenix Sylvestris, Roxb.) Arddhacandra, Candravarga, Sūcimukha and Abānmukha.³

Pālakapya⁴ mentions ten kinds of śastras :—1. Vṛddhipatra. 2. Kuśapatra. 3. Mandalāgra. 4. Vṛthimukha. 5. Kuṭhārī. 6. Vatsadanta. 7. Utpalapatra. 8. Śālākā. 9. Sūci or needles. 10. Rampaka. Besides these he refers to Vāḍiśa.

Of the blunt instruments he mentions:—Jāmvobouṣṭha—(four in number, for application of actual cauteries), Sīmhadaṁṣṭrā, Godhāmukha, Kaṅkamukha, Kuliśamukha—(for extraction of foreign bodies), Eṣaṇī or probes (three), wound syringe, Vastiyāntra, Śālākā or rods, yaṣṭhiyāntra, Karkataka, Dyātūha, Makaraka (crocodile), Śārdḍūlamuṣṭhika (tiger's claws), Nandimukha (Turdus Ginginianus).

¹ एषण्या गतिमन्विष्य चारसूत्रानुसारिणीम् ।

सूचीं निदध्यादयन्ते प्रोन्नाम्याय विनिहरेत् ॥

Bhāva Prakāśa. II. iv., Nāḍi Vraṇādhikāra.

² भागानुजे भिषगाङ्गीं शस्त्रेणीतृकृत्य यत्नतः ।

जान्नीडोनाग्निवर्णेन तप्तया वा शलाकया ॥

Ibid. Bhagandarādhikāra.

³ गतिमन्विष्य शस्त्रेण हिन्द्यात् खर्जूरपत्रिकम् ।

चन्द्रार्धं चन्द्रवर्गं सूचीमुखमवास्तुखम् ॥

Ibid.

⁴ तत्र शस्त्राणि दशनामसंस्थानानि भवन्ति । तद्यथा वृद्धिपत्रम्, कुशपत्रम्, मण्डलाग्रम्, त्रौहिमुखम्, कुठाराग्रम्, वत्सदन्तम्, उत्पलपत्रम्, शलाका, सूची, रम्पकश्चेति । फाल्जाम्बवतापिकादर्थ्याकृतयश्चेति । एतान्याग्निकर्मविधाने चत्वारि चान्यानि शल्यद्वरणानि यथायीगं सिद्धद्रं गोधामुखं कङ्कमुखं कुलिशमुखं चेति । तिस्र एषिषयः ।

Hastī Āyurveda, III. xxx.

CHAPTER V.

DESCRIPTION OF THE BLUNT INSTRUMENTS.

Now we shall describe the instruments in detail. The Yantras or the blunt instruments will be considered first, and next the Śastras or the sharp instruments.

I. The Svastika yantra or Cruciform Instruments.

The word svastika is a technical term signifying one of the twenty-four signs of the Jinas; and it can be represented by two lines crossing each other, the arms of the cross being bent at their extremities towards the same direction. So these instruments may be described as cruciform. They have as a rule a length of eighteen aṅguli. Their ends should be shaped like the faces of the following ferocious beasts (1 to 8), deer (9), and birds (10 to 24), and the instruments are to be called after their names.¹ They are divided into two classes; the instruments of class I resemble the mouths of lion (simha) and tiger (vyāgra), while class II comprises the instruments which have the likeness of the faces of birds of prey. The fulcrums of these instruments which are at the middle, are of the size of a masūra (Ervum lens). The handles are either rounded off, or bent at an angle at their ends, like an elephant driver's goad—the object being to afford a good grasp of the instrument by the surgeon's hands. The svastika instruments are used for the extraction of

¹ तत्र खलिकयन्त्राणां द्वादशाङ्गुलप्रमाणानि सिद्ध्यन्ति प्रवृत्ततरुचुचवर्षीपिमाजार्श्वगालचूने
व्याधककाककङ्कुररचासभासशशवात्यलुकचिह्नस्थेन गृध्रक्रौञ्चधङ्गराजाङ्गलिकर्पावभङ्गननन्दि-
मुखमुखानि मयूराह्वतिभिः कौलेरववहानि मूलेऽङ्गुलश्रवदाहचतवारङ्गाण्याश्चिबिनष्टशब्दोद्धार-
णार्थमुपदिश्यन्ते ।

foreign bodies impacted in the bones.¹ If the foreign body is visible, extract it by the lion forceps or similar forceps of class I. If it is invisible, it should be extracted by the Heron forceps, or similar forceps of class II. Of all the varieties of svastika instruments, the Heron forceps (kaṅka-mukha) is the best, for it can be easily introduced and turned in all directions, and also it grasps firmly and extracts a foreign body with ease and can be applied without any harm to all parts of the body.²

Class I:—

1. Simhamukha svastika or Lion-faced forceps:—this instrument is said to have its mouth shaped like that of a lion (Felis leo). It is the principle instrument of the class I. It is

- ¹ तुल्यानि कङ्कसिंहचक्राकादिमृगपक्षिणां ।
मुखैर्मुखानि यन्त्राणां कुर्व्यात्तत् संज्ञकानि च ॥
अष्टादशाङ्गुलयामान्यायसानि च भूरिशः ।
मसूराकारपर्यन्तैः कण्ठेवद्भानि कौलकैः ॥
विद्यात् खल्लिका यन्त्राणि मूलीऽङ्गुशनतानि च ।
ते दृढे रश्मिसंलग्नं शल्याद्वरणमिष्यते ॥

Aṣṭāṅga Hṛdaya. I. xxv.

- ² दृश्यं सिंहमुखाद्यैस्तु गृह्यं कङ्कमुखादिभिः ।
निर्हरेत्तु शनैः शल्यं शास्त्रयुक्तिव्यपेक्षया ॥
निवर्तते साध्ववगाहते च शल्यं निगृह्णीक्षरते च यच्चात् ।
यन्नेष्यतः कङ्कमुखम् प्रधानं स्थानेषु सर्वेष्वधिकारि चैव ॥

Suśruta Saṁhitā I. vii.

निवर्तते साध्ववगाहते च
शास्त्रं गृह्णीक्षरते च यच्चात् ।
यन्नेष्यतः कङ्कमुखं प्रधानं
स्थानेषु सर्वेष्वधिकारि यच्च ॥

Aṣṭāṅga Hṛdaya. I. xxv.

curious that in modern times, the European surgeons use a pair of forceps called the Lion forceps for holding bones firmly during operations. So the *Mākaramukha* of *Pālakapya* is the Crocodile forceps.

2. *Vyāghramukha* or Tiger forceps: the mouth of this instrument is like that of a tiger (*Tigris regalis*).

3. *Vṛkamukha* or Wolf forceps (*Canis lupus*).

4. *Tarakṣumukha* or Hyena forceps (*Hyena striata*).

5. *Rkṣamukha* or Bear forceps (*Ursus Americanus*).

6. *Dwīpimukha* or Panther forceps (*Felis pardus*).

7. *Mārjāramukha* or Cat forceps (*Felis domestica*).

8. *Śṛgālamukha* or Jackal forceps (*Canis aureus*).

9. *Airbbārūka* or Deer forceps (*Cervus elephas*).

Class II:—The birds, in imitation of whose faces the instruments of this class are made, can be identified from the following description of their beaks:—

Birds: 1. Raptatories: they have curved beaks hooked at the extremity.

(a) *Strigidæ*...owls...strong hooked beaks bent down from base.

(b) *Vulturidæ*...vultures...long straight beaks bent down at tip.

(c) *Accipetridæ*...falcons, osprey and eagle...short, usually dentated beaks, hooked at the ends.

2. *Pessaries*...(a) *Lanidæ*...shrike...hooked and strongly serrated beak. (b) *Cervidæ*...crow and blue-jay...beaks strong, thick, somewhat curved anteriorly and slightly notched.

3. *Grallatories*...*Heroidæ* or *Ardeidæ*...herons and *kraufica*...they have long and powerful beaks with sharp hard

edges, somewhat curved at the point, rarely spoon-shaped, with long neck.

The instruments are—

10. Kākamukha or Crow forceps (*Corvus corone*).
11. Kaṅkamukha or Heron forceps (*Ardea cenerca*).
12. Kurāramukha or Osprey forceps (*Pandion haliaetus*).
13. Cāsamukha or Blue-jay forceps (*Garrulous* or *Corvus cristatus*).
14. Bhāsamukha or Eagle forceps.
15. Śasaghātimukha or Hawk forceps (*Nanclerus furcatus*).
16. Ulūkamukha or Owl forceps (*Strix flammea*).
17. Cillimukha or Kite forceps (*Milivus ictinus*).
18. Śyenamukha or Vulture forceps (*Vulture cinereas*).
19. Gṛdhramukha or Falcon forceps (*Peregine falcon*).
20. Krauficamukha (*Ardea jaculator*); or Curlew (*Numenius Arquatus*).
21. Bhr̥ṅgarājamukha or Fork-tailed or Butcher-bird forceps (*Lanius excubitor*).
22. Añjalikarṇamukha—birds not identified.
23. Avabhañjanamukha „ „ „
24. Nandimukhamukha (*Turdus Ginginianus*).

II. The Sandamśa or Pincher-like Forceps.

The second class of instruments—the Sandamśa¹ or pincher-like forceps—comprises only two instruments: the forceps with and without handles. The first variety is likened

¹ सनियहोऽनियहश्च सन्दंशो वीक्ष्याद्गुणी भवतस्त्वन्मोक्षसिरासायुतमन्वीक्षारणार्थं
मुपदिश्यते ।

to forceps with arms, used by the barbers for depilating the nasal cavities, while the second variety is like the armless force used by the goldsmiths. The former consists of two arms joined crosswise by a pin fixed at about their middle points, and really is a cruciform instrument but is classed here for its different use in surgery. The forceps without handles consists of two blades soldered at one end. Some commentators like to subdivide the pinchers into two classes according as their ends are rough or smooth. And so Hessler translates:¹ "*Dua forcipes denticulata et non denticulata*".

The sandamśas are used for the purpose of extracting foreign substances from the soft structures of the human body, such as the skin, muscles, veins, nerves, and tendons². Generally they have a length of sixteen aṅguli.

Vāgbhata II mentions two other instruments as modifications of the type:—

(a) One variety has the length of six aṅguli. It is intended for the purpose of extracting minute foreign bodies such as thorn, hair &c. and of removing the superfluous eyelashes.³

Cakrapāṇi also advises us to use a sandamśa for epilation, which may be called the Epilation forceps.⁴

¹ Hessler's *Sūśruta*. Caput vii. P. 14.

² कौलवञ्च कियुक्तायौ सन्दंशौ षोडशाङ्गुली ।
त्वक्सिरास्त्रायुपिशित त्वक् शल्यपकर्षणे ॥ ५ ॥

Aṣṭāṅga Hṛdaya, I. xxv.

अतिगुप्तञ्च शल्यञ्च सन्दंशेन समुद्धरेत् ।

Hārīta Saṁhitā, III. lvi.

³ षडङ्गुलीऽन्वीहरणे त्वक् शल्यो पपक्काणां ॥ ६ ॥

Aṣṭāṅga Hṛdaya, I. xxv.

⁴ See foot-note 2, p. 66.

Similarly in modern times, we remove superfluous eyelashes by the Epilation forceps. Mr. Berry writes¹:—"When the trichiasis is only partial, a temporary improvement is obtained by epilation. In some cases where a few eyelashes only have been left altogether, the patient may procure for himself a pair of forceps, and have the eyelashes removed whenever they cause irritation." Surgical epilation was frequently necessary for trichiasis among the Romans and a similar forceps was in use there.²

In ancient times in India, the barbers used epilation forceps for pulling out grey hairs. In Makha-deva jātaka, we find the following conversations between the king and his barber³:—

"Barber. There is a grey hair to be seen on your head,
O King."

King. Pull it out, then, friend, and put it in my hand.

So he tore it out with golden pinchers, and placed it in the hand of the King."

(b) The second variety is known as the Mucutī instrument.⁴ It is a pair of straight forceps, having no curve like that of the sandamā. It is serrated finely at the open ends. The soldered end has a ring attached to it as ornamentation. It is recommended to be used for removing painful sloughs and proud granulations from a deep-seated abscess. It is also to be used to

¹ Practical Ophthalmology, 1904. By G. A. Berry, M.B. P. 52.

² Paulus Aegineta. VI. xiii. (Syd. Soc. Ed.)

³ Rhys David's Buddhistic jātaka stories, Vol. I, pp. 187.

⁴ मुकुटी इव दन्तमुकुले दन्तमूत्रवा ।

नवीर नयनोद्योती चार्धवाः प्रीयितव्ये च ॥ ७ ॥

complete the operation for pterygium by removing the remnant, after it has been extirpated by the sharp instruments. • Suśruta calls it Mucundrī¹, and uses it to hold the pterygium after it has been raised by vaḍiśa or hook. It must be then a smaller variety of mucuṭī.

A similar pair of forceps, Dr. Erichsen mentions, and says² that "for the purpose of extracting needles, thorns, splinters of wood and other foreign bodies of small size and pointed shape lying in narrow wounds, forceps with very fine but strong, well-serrated points will be found useful."

Suśruta mentions baṁsabadala³ or bamboo forceps. It is made of a piece of bamboo rod, split longitudinally into two halves nearly to its whole extent. This is like the bamboo tongs used by the smokers in Bengal to raise glowing charcoal to the earthen bowl. It should be used to remove worms from the surface of the human body.

The sandaṁśa instrument may be compared with the modern dressing forceps and with the forceps still used by the goldsmiths, known as a sonnā. Those with arms have their counterpart in the sādāsī or a pair of pinchers, still used by the blacksmiths.

III. Tāla Yantra or Picklock-like Instruments.

The third class of blunt instruments is called Tāla-

¹ अपाङ्गं प्रेक्षमाणस्य वङ्गिणि समाहितः ।
मुकुण्डागृहं मेधावी सूचीस्त्रेण वा पुनः ॥

Suśruta Saṁhitā, vi. xv.

² Erichsen's Science and Art of Surgery, Tenth Ed. vol. I. p. 342.

³ तान्मृदुलैस्तेनाभ्यक्तस्य वंशविद्धैस्तेनापहरेत् ।

Suśruta Saṁhitā, IV. xxvii.

yantra¹. The word tāla "has been differently interpreted by the commentators. Bhānumatī gives the alternative reading (tālu i.e., palate) for tāla, so the instruments likely had their ends shaped like the palatine process of fish. Dallana,² however, maintains that tāla means picklock, the ordinary Indian key which resembles a hook. Two of these are joined at one end, the curved ends being kept free, facing one another. The instrument would then resemble the face of a bhetuli fish. Instruments with one tāla or hook resemble one lip of the fish, and those with two tālas represent its entire face. Both Cakrapāṇi and Dallana however prefer to mean by tāla, the scale of a fish."

They have a length of twelve aṅguli, and are shaped like the jaws of a fish. They may be made either with a single blade (ekatāla) or with double blades (dvitāla) soldered at one end, the hooked ends being free. They are intended for the purpose of extracting foreign bodies from the ear, nose and other outer canals of the body. The ear scoop now used by the barbers of India for extracting wax from the ear is a tālayantra.

¹ तालयन्त्रे द्वादशाङ्गुलि मत्स्यतालुवदेकतालहितालके कर्णमासानाङ्गीश्लथानामा-
हरणार्थं ।

Suśruta Saṁhita, I. vii.

हे द्वादशाङ्गुलि मत्स्यतालुवदेक तालके ।

ताल यन्त्रं श्रुते कर्णनाङ्गी श्लथपहारिणी ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv.

² अत्र ताल-शब्देन प्रदेश उच्यते । एतेन एकं तालं प्रदेशी यस्य तदेकतालं, हे ताले प्रदेशौ यस्य तत् द्वितालकम् ; एतेन मत्स्यस्य श्लक्वत्प्रतनुमुखं प्रदेशं एकताल मत्स्यश्लक्वत् प्रतनुमुखं द्विप्रदेशं द्वितालमित्युक्तम् । परिष्णाहस्य कर्णादिप्रवेशी श्रेयः । अन्ये तु मत्स्यतालकवदेकतालकद्वितालके इति पठन्ति । व्याख्यानयन्ति च मत्स्यस्य भेटुनिमत्स्यः, तस्य लौहमयतालकाकारं मुखं भवति अतस्तन्मुखाङ्गीकारं यन्त्रमेकतालकं, सर्वमुखाकारं द्वितालकं, तालकोऽत्रचपवारकादिपाटसन्निवन्धनं लौहमयमुच्यते ।

Dallana's Commentary, I. vii.

For removing substances that have fallen into the meatus auditorius, Paul says:¹ "They must therefore be extracted by an earpick, a hook, or tweezers, or by using powerful shaking of the head, while the ear is placed upon some circular board." Albucasis recommends us to use a slender forceps, which resembles the modern dissecting forceps. He also commends for the purpose a hook slightly bent, which is also mentioned by Celsus.²

IV. The Nāḍi Yantra or Tubular Instruments.

The Nāḍi or tubular instruments are described to be of various kinds and to serve many purposes³. They are open either at one or both ends. These are used for the extraction of foreign substances from the natural outlets of the body. They are also recommended to be used as a diagnostic apparatus for inspection of diseases in the canals. They are the means of sucking out fluid discharges, as pus *etc.*, from cavities and they facilitate the performances of other operations. They vary in length and diameter in proportion to the different sizes of the outer canals of the body, or according to the varieties of purposes to be served by them.

¹ Paulus Ægineta, Vol. II. VI. xxiv. (Syd. Soc. Ed.)

² Celsus, VI.

³ नाडी यन्त्राण्यनेकप्रकाराण्यनेक प्रयोजनान्येकीमुखान्युभयतीमुखानि च तानि कीर्तयितुं शक्यते इति रोगदर्शनार्थमाचूषणार्थं क्रियासौकर्यार्थाच्चेति तानि कीर्तयितुं परिभाषितवानि अष्टाङ्ग परिराष्ट्रदीर्घाणि च ।

Suśruta Saṁhitā, I. vii.

नाडीयन्त्राणि शुषिराण्यनेकानेक मुखानि तु ।

कीर्तयितुं शक्यते इति रोगदर्शनार्थमाचूषणार्थं क्रियासौकर्यार्थाच्चेति तानि कीर्तयितुं परिभाषितवानि

अष्टाङ्ग परिराष्ट्रदीर्घाणि च ।

नदिकार परिभाषा देव्यं कीर्तयितुं दीर्घतः ॥ २ ॥

Aṣṭāṅga Hrdaya Saṁhitā, I. xxv.

The tubular instruments are used for fistula-in-ano, haemorrhoids, tumours, abscesses, injections into the rectum, vagina and urethra, hydrocele, ascites, inhalations, stricture of urethra and rectum and cupping as by gourd and horns.¹

As examples of the tubular instruments, Vāgbhaṭa II. mentions :—

1. KANṬHASALYĀVALOKINI² OR THROAT SPECULUM.

To examine foreign substances such as a fish-bone in the throat, the instrument should have a length of ten aṅguli and a circumference of five aṅguli.

Suśruta describes the extraction of a foreign body, made of lac from the *throat of a patient by the following device. A heated iron probe or sound should be introduced into the throat of a patient through a tube of copper and made to touch the bit of shellac. The foreign substance would begin to dissolve or soften and so will adhere to the probe. The rod is then to be cooled by sprinkling water through the tube and the foreign body then should be drawn out steadily with it.³ But other kinds of foreign bodies are to be extracted from the throat by means of a rod-like instrument, one end of which is smeared with melted wax or shellac.

The use of some adhesive substance for extraction of foreign bodies accidentally introduced into the outer passages of the

¹ भगन्दराशोऽर्धद्वयवस्तुत्तरवसिभूषणद्विदकोदरधूमनिबद्धप्रकाशसन्निबद्धगुदयन्त्राणां-
कावृण्णयन्त्राणि चोपरिष्टाद्व्यामः ।

Suśruta Samhitā, I. vii.

² दद्यात्कुलार्धमाङ्गल. कण्ठसल्यावलोकिनी ।

Aṣṭāṅga Hṛdaya, I. xxv.

³ ज्ञातुं कण्ठासन्ने कण्ठे नाडीं प्रवेष्ट्वाप्रितमाच्च शलाकां तयावगृह्य शीताभिरग्निः
परिषिष्य स्थिरीभूतमुद्धरेत् । अज्ञातुं जलुनधूष्टकलितया शलाकया पूर्वकःपेनेत्येके ।

Suśruta Samhitā, I. xxvii.

human body was well known to the Greeks and Romans. Paul says:¹ "Stones and such like bodies we extract by wrapping wool round an earpick, and smearing it with turpentine-rosin, or some glutinous substance, and introducing it gently into the meatus auditorius."

2. PAÑCAMUKHA AND TRIMUKHA.

To take a good hold of a four-eared arrow, a speculum having five holes (PAÑCAMUKHA) should be had recourse to; and for a two-eared arrow, a speculum having three holes (TRIMUKHA) would be necessary. The central hole is for the arrow, while the side holes are meant for the ears of the arrow.²

Celsus³ says that when a weapon buried in the flesh has barbs too strong to be broken with forceps, they may be shielded with split writing-reeds (*Calamus scriptorium*), and the weapon thus withdrawn.

Paul says: "Some apply a tube round about the barbs⁴ so that when they draw out the weapon, the flesh may not be torn by the barbs."

In modern times a snare is used instead of a tube. Dr. Erichsen⁵ writes: "The extraction of an arrow is usually attended with little difficulty. But if barbed, special precautions have to be taken. With the view of safely effecting its removal, the snares.....have been devised."

¹ Paulus Ægineta. Vol. II. VI. xxiv. (Syd. Soc. Ed.)

² नाडीपञ्चमुखच्छिद्रा चतुष्कार्णस्य संयुक्ते ।

वारङ्गस्य द्विकार्णस्य त्रिच्छिद्रा तत् प्रमाणतः ।

Aṣṭāṅga Hṛdaya, I. xxv.

³ Celsus. vii. v.

⁴ The Works of Paulus Ægineta. vi. lxxxvii.

⁵ The Science and Art of Surgery. Vol. I. pp. 343.

3. TUBULAR INSTRUMENTS FOR INSPECTION OF ARROWS.

Again for the inspection of the arrows, various kinds of tubular instruments would be necessary, which will vary according to the shape, length, and circumference of the arrows and their ears.¹

4. ŚALYANIRGHĀTANĪ.

The top of this tubular instrument is shaped like the disc of a lotus and is closed. The other end is open and leads to a hollow extending to a fourth part of the tube. It has a length of twelve *añguli*. It is useful for removing an arrow fixed deeply into the body, in different directions and thus helping its easy extraction.² For this purpose *Suśruta* directs us to use a stone hammer.

The *Śalyanirghātani* had its counterpart in the female part of the *Impellent*, mentioned by *Paul*, for forcing an arrowhead forwards through a part so as to extract it at the side opposite to that of its entrance. It would thus be seen that the function of the *Impellent* was similar to that of the *Śalyanirghātani*; the former moved it forwards, while the latter moved the *śalya* side to side, the object of both being to extract the foreign substance. The *Impellent* would seem to have been a plain rod of metal pointed at one end (the male part) and hollowed at the other (the female part); the pointed end used to be introduced into the socket of an arrow when it possessed one, and the hollow

¹ वारह्म कर्चसंख्यान नाह देष्मोन्नीयतः ।

नाहीरेव विधावाद्या ददु' अस्याचि कारयेत् ॥ १० ॥

Aṣṭāṅga Hṛdaya, I xxv.

² पद्मचर्चिकया मूर्ध्नि सङ्घटी वादवाहृता ।

चतुर्धं वधिरागादी अज्जनिर्वातनी मता ॥

end was meant to fit over the tail in case where the arrow was tanged.¹ The Greeks and Romans recognised the necessity of an arrow being moved about until loosened, if it remained fixed in the bone; and Celsus² directs us to strike it with some iron instrument until it be shaken from the place where it is lodged.

5. TUBULAR INSTRUMENTS FOR PILES.

According to Suśruta³ these should be made either of iron, or ivory, or horn or wood. They are hollow instruments tapering at the end which should be shaped like the teat of a cow. For males, the length is four *āṅguli*, while the circumference is five *āṅguli*. In the case of females, however, the tube should be made wider, the circumference being six *āṅguli*, and longer, the length being equal to the space covered by the palm of the hand. There are two slits on the sides—one for inspection of diseases and the other to allow application of caustic and cautery to the diseased part. The slit measures three *āṅguli* in length and the pulp of the thumb in breadth. At a distance of a half *āṅguli* from the margin of the slit, is raised a circular projection, also a half *āṅguli* high.

¹ Paulus Ægineta, VI. lxxxviii.

² Celsus, VII. 5.

³ तच्च यन् लोहि दानं शार्ङ्गं वाचं वा गीक्षमाकारं चतुराङ्गुलायतं पञ्चाङ्गुलपरिणाहं पुंसां षड्ङ्गुलपरिणाहं नारीणां तलायतं तद्विच्छिद्रं दर्शनायमेकं छिद्रमेकं छिद्रन्तु कर्षयिषि । एकहारे हि शस्त्रचाराग्नीनामतिक्रमो न भवति । छिद्रप्रमाणन्तु त्र्यङ्गुलायतमङ्गुलीदर-परिणाहं यदङ्गुलमवशिष्टं तस्याष्टाङ्गुलमवसादश्चाङ्गुलीच्छितोपरिष्ठसकर्णिकामेषयन्माक्रान्ति-समाप्तः ।

Vāgbhaṭa¹ describes two different instruments, one for inspection and the other for medication. They both have the same length and circumference. The former has two slits on the side, while the latter has only one slit, three aṅguli long and the pulp of the thumb in width. The annular projection is turned upwards : the object being the prevention of sudden introduction of the instrument too far inwards.

A similar instrument without any slit on the side is called Śamī². It is advised to be used for exerting pressure over the piles by its introduction into the rectum (Vāgbhaṭa.)

Rectal speculum is mentioned by Hippocrates in his treatise on fistula³ and by Paul in the treatment of piles.⁴ It is called Calopter in contradistinction to the vaginal speculum which is called Diopter. The rectal speculum in the Naples museum is a two bladed instrument working with a hinge in the middle. In modern times, both the varieties of the speculum, tubular and valved, are in use.

For inspection and medication of piles, a tubular speculum is recommended to be used by the veterinary surgeons. In the

¹ अर्शसां गीस्तनाकारं यन्त्रकं चतुरङ्गुलम् ।
नाह्नि पञ्चाङ्गुलम् पुंसां प्रमदानां षड्ङ्गुलम् ।
विच्छिद्रं दर्शने व्याघरेकच्छिद्रन्तु कर्णायि ।
मज्जेऽस्य चतुरङ्गुलच्छिद्रमङ्गुलीदरं विसृतम् ।
अङ्गुलीच्छितीकृतं कर्णिकञ्च तद्गुह्यतः ॥

Aṣṭāṅga Hṛdaya Samhitā, I. xxv.

² शस्याख्यां तादृग्च्छिद्रं यन्त्रमर्शः प्रपीडनं ॥ १३ ॥

Ibid.

³ The Genuine Works of Hippocrates. (Syd. Soc. Ed.) Vol. II. P. 817.

⁴ Paulus Aegineta, VI. lxxix.

Aśvavaidyaka, Jayadatta sūri¹ describes the instrument thus :
 "The surgeon should know the instrument to have the length of six aṅguli. On the two sides, the wise surgeon should make two slits, three aṅguli long and a half aṅguli broad. Through an instrument with two slits, the piles of the horses should be examined. Through a speculum with one slit, the surgical operations, such as incisions &c., should be performed, after having tied the horse and making him lie down".

6. TUBULAR INSTRUMENTS FOR FISTULA-IN-ANO.

These are similar to the instruments used for the inspection and medication of piles, the only difference being the omission of the circular rings in their construction, for otherwise, the projection may rub over the sore if the speculum be introduced deeply.²

¹ यत्नं षडङ्गुलं विद्वान् छिद्रं पञ्चाङ्गुलं भिषक् ।

अधोऽर्द्धाङ्गुलाविक्षीर्णं दैव्येणाप्यङ्गुलत्रयम् ॥

उभयोः पार्श्वयोस्तस्य कुर्याच्छिद्रद्वयं वुचः ।

• अर्थत्वेन तु बाह्यस्य द्विच्छिद्रेण विलोकयेत् ॥

एकच्छिद्रेण वै कर्म्म कुर्याच्छेदादि पूर्व्वकम् ।

पातितस्य सुवङ्गस्य तुरङ्गस्य विचक्षणः ॥

Aśvavaidyaka (Bibliotheca Indica). Liii, vs. 4, 5 and 6.

² छिद्राद्दृष्टं हरेदीष्टमर्थयन्तस्य यत्नवित् ।

ततो भगन्दरे दद्यादेतदङ्गेन्दु सन्निभं ॥

Suśruta Saṁhitā, IV. viii.

सर्व्वथाऽपनयेदीष्टं छिद्राद्दृष्टं भगन्दरे ।

Aṣṭāṅga Hṛdaya, I. xxv.

7. TUBULAR INSTRUMENTS FOR THE NOSE.

Nasul-Speculum.

Similar tubular instrument without ring is to be used for examination of nasal diseases as tumours and polypus. It is however shorter and thinner than the rectal speculum. Vāgbhata says: "It is two aṅguli long and admits the index finger in its lumen. The tube has a single slit on the side."¹

He describes nasal tubes for introducing medicated powders into the nose as snuff.² After partially filling the tube with powders, one should blow through the empty end, the other end being put well inside the nasal cavity. Suśruta also uses a tube to blow powder into the nose.³ Caraka⁴ mentions nasal insufflation to cure diseases. Śārṅgadharā⁵ and Cakradatta⁶ describe the nasal tube for insufflation to be six aṅguli long and open at both ends.

¹ प्राचान्मर्दानसमिलच्छिद्रा नाद्यङ्गुलद्वया ।

प्रदेशिनी परिष्काया स्यान्नन्दर यन्त्रवत् ॥ १५ ॥

Aṅgāṅga Hṛdaya, I. xxv.

² आपनं विरेचनदूर्ध्वो युक्तात् तं मुखवायुना ।

वक्त्रमुलबिमुखया नाद्या निवज्जनर्भया ।

Ibid. I. xx.

³ नासास्त्रावे प्राचतदूर्ध्वमुक्तां नाद्याद्वयं वीजवपीकवतीक्षः ।

Suśruta Saṁhitā, VI. xxiii.

⁴ सिद्धिं स्याद्वापनं दूर्ध्वंवेद्यां प्रथमये हितं ।

Caraka Saṁhitā, VI. xxvi.

⁵ वक्त्रमुल विवक्त्रा या नादी दूर्ध्वंनयो धमिन् ।

तीक्ष्णं कीलनितमङ्गु वातैः प्रथमनं हितं ॥

Śārṅgadharā Saṁgraha, III viii.

⁶ आपनं विरेचनदूर्ध्वो युक्तात् तत् मुखवायुना ।

वक्त्रमुल बिमुखया नाद्या निवज्जनर्भया ॥

Cakradatta, Nāyādhikāra.

Aretaeus says that a quill or reed or a wide long tube may be used for blowing powders into the pharynx. Alexander Trallianus² says that a calamus scriptorium, the joints of which have been removed, may be used as an insufflator. Oribasius³ however gives the fullest description of the tube used as a nasal insufflator. "A reed slender and with a straight bore, 6 inches in length, and of such a size that it can be passed in the nares, is taken and its cavity entirely filled with medicament. The reed may be either natural or of bronze. This being placed in the nares, we propel the medicament by blowing into the other end."

In modern times, we advise our patients to do the same thing when powders are prescribed to be thrown into the nose or ears. The cylindrical shaft of the ordinary quill so cut as to be open at both ends will serve the purpose admirably. The nasal insufflator is used now for identical object.

Aretaeus⁴ mentions a nasal syringe with a double tube. It consists of two pipes united together by an outlet so that liquid medicine may be injected into both the nasal cavities simultaneously, for injection into each nostril separately, he points out, can not be borne.

It is remarkable that in Mahāvāgga⁵ mention is made of single and double nose-spoons. Nāthu-karaṇi (*i.e.*, an instrument to hold up the nose, so that the medicated oil

¹ Aretaeus, Vol. II., P. 408.

² Alexander Trallianus, IV. viii.

³ Oribasius Collect, xii.

⁴ Aretaeus, Ed. Adams, Vol. II., P. 459.

⁵ Mahāvāgga, VI. 13. 1 & 2. Sacred Books of the East.

does not run out...Ed.) and Yamaka-nāthu-karaṇi (*i.e.*, one that would go up both nostrils...Ed.). They are recommended to be made of gold, or silver, or bone, or ivory, or horn, or of the *nala* reed, or of bambu, or of wood, or of lac, or of the shells of fruit, or of chank-shell". (Sacred Books of the East).

To apply oily medicines inside the nasal cavity a cotton wick is first soaked in the oil and then it is pushed well inside the nose. It is recommended also to pour oil into the cavity through a tube, while the other cavity is pressed by a finger (Vāgbhata¹).

To treat a case of fracture of the nasal bones, Suśruta recommends² two straight tubes open at both ends to be introduced into the nasal cavities, after putting the fractured ends in position, either lowering or elevating the raised or depressed end by a rod as required. Then bandages are to be applied. The tubes serve as splints to support the broken ends in position, while through their orifices the patient may breathe without inconvenience.

Similarly Celsus, after replacing the fractured ends in position uses oblong tents sewed round with a thin soft skin as splints into the nostrils; or a large quill smeared with gum, or artificer's glue may be applied in the same way. Paul also

¹ नासापुटं पिपायेकं पथ्यायेण निषेचयेत् ।

उष्णास्तु मेघज्वं प्रनाद्या पितुनाऽथवा ॥

Aṣṭāṅga Hṛdaya, I. xx.

² नासां सन्नां विवृतां वा ऋज्वीं कृत्वा शलाकया ।

पृथग् नासिकयोनाद्यौ द्विमुखौ संप्रवेशयेत् ॥

ततः पट्टेन संवेष्ट्य दृढसिकं प्रदापयेत् ॥

Suśruta Saṁhita, VI. iii.

says: "And some sew the quills of the feathers of a goose into the rags, and thus introduce them into the nose, in order that they may preserve the parts in position without obstructing the respiration; but this is unnecessary as respiration is carried on by the mouth."¹

Suśruta also advises us to introduce these tubes into the nasal cavities during the performance of the Rhinoplastic operations.²

8. THE AṄGULI-TRĀṆAKA OR FINGER-GUARD.

Vāgbhaṭa says:³ "It is generally made either of ivory or wood. The instrument is shaped like the teat of a cow, and is four aṅguli long. Two slits occur on the sides like those in the speculum for piles."

It protects the finger of the surgeon from being injured by the teeth of the patient and so helps the surgeon in opening the mouth of the patient with ease.⁴

In modern times, finger-guards are used for the same purposes.

¹ Paulus Ægineta, Vol. II. vi, xci. Syd. Soc. Ed.

² सुसंहितं सम्यगथो यथावन्नाड़ीद्वयेनाभिसमीच्या वद्धा ।
प्रोन्नस्य चेनामवचूर्णयेच्च पक्ष्मयटीमधुकाञ्चनैश्च ॥

Suśruta Samhita, I. xvi.

³ अङ्गुलित्राणकं दान्तं वार्चं वा चतुरङ्गुलम् ।
द्विच्छिद्रं गोशनाकारं तद्वन्नविहतौमुखं ॥

Aṣṭāṅga Hr̥daya, I. xxv.

⁴ तच्च वक्त्रं विहतौ, सम्भृतं मुखस्यातुरस्य मुखव्यादानं निमित्तं 'सुखं' 'सुखकरं' स्यात् ।
यत इदं दन्तघातात् रक्षति भवत्युक्तं 'सुखमिति' ।

Vāgbhaṭārtha Kaumudī, I. xxv.

अङ्गुलिदेहेभ्यो रक्षणार्थत्वाद् अङ्गुलित्राणमिति नाम ।

Sarvāṅga Sundarī, I. xxv.

9. JONĪ-VRANEKṢAṆA OR VAGINAL SPECULUM.

Vāgbhaṭa¹ describes it to be a tubular instrument, sixteen aṅguli long, and six aṅguli in circumference. It consists of four blades, attached at their bases to a ring. The tube tapers gradually, the end is free and looks like the bud of a lotus. To the four blades are soldered four rods in such a way that on pressing their free ends, which pass out of the ring, by the surgeon's hands, the tapering end of the tube would gape widely. The surgeon by regulating the pressure of his hand, may open or close the speculum to any desired extent.

Another kind of vaginal speculum used to be manufactured out of the two horns of a buffalo by dividing each into two longitudinal halves. They should be so paired that their concave surfaces would look towards one another, their ends diverging outwards. So we get a pair of bivalve speculum out of a pair of horns.

The bivalve speculum of horn mentioned above, has its modern counterpart in the pair of speculum known as Barne's or Neugebauer's speculum.

¹ योनिव्रणेक्षणं मध्ये शुषिरं षोडशाङ्गुलम् ।

मुद्रावज्जं चतुर्भिस्तन्मोज मुकुलाननं ।

चतुःशलाकमाक्रान्तं मूले तद्विकसेन्मुखे ॥ १७ ।

Aṣṭāṅga Hrdaya, I. xxv.

अस्य यन्त्रस्य कल्पनायां चत्वारिखण्डानि तथा कार्याणि यथा मुद्रिकया वज्जानि मिलितानि च पद्ममुकुलाकारं मुखं, अन्तरं शुषिरं षडङ्गुलं परिणाद्वती नाडी स्यात् । ततस्तन्मध्ये प्रत्येकं खण्डसंलग्नं चतस्रः शलाकाः आमुखात् सन्निवेश्य शलाकानामप्यभागे तथा वधीयात् यथा शलाकामूलं पीडनेन यन्त्रस्य मुखं विकसेत् ।

Vāgbhaṭārtha Kaumudī, I. xxv.

The vaginal speculum or Diopter is mentioned by Soranus, Paul¹ and other Greek surgeons. Paul describes its method of working as follows:— "The person using the speculum should measure with a probe the depth of the woman's vagina, lest the stalk (fistula) of the speculum being too long, it should happen that the uterus should be pressed upon. If it be ascertained that the stalk is larger than the vagina, folded compresses are to be laid on the *alæ pudendi*, in order that the speculum may be placed upon them. The stalk is to be introduced, having a screw at the upper part, and the speculum is to be held by the operator; but the screw is to be turned by the assistant, so that the *laminæ* of the stalk being separated, the vagina may be distended." The accounts given by Albucasis² and Haly Abbas³ are similar. These instruments are described to be bivalve, trivalve or quadrivalve. A quadrivalve speculum of the Greeks is identical with the *Joni-vranekṣana* of the Hindus; the only difference being that the former is acted by screw mechanism, while the latter is worked on the principle of the lever. Drawings of several shorts of the Greek instruments are given in the surgery of Albucasis and by Schultet.⁴ There are three specimens of vaginal speculum in the Naples museum, drawings of which are given by Milne. In modern times, we use similar valvular speculum for identical purposes.

¹ Paulus Ægineta, Vol. II. vi. lxxiii. Syd. Soc. Ed.

² Albucasis, *Chirurgia*, II. 71.

³ Haly Abbas, *Pract.* ix. 57.

⁴ *Arsenal de chirurg.* tab. 18.

10. TUBULAR INSTRUMENTS FOR WOUNDS.

Vrana-vasti or Wound-syringe.

If the wound be caused by deranged air and be very tender, especially if it forms on the lower half of the body, the vasti should be used. In diseases of the urinary organs, such as, obstruction of urine, faulty conditions of urine, impure semen, stone in the bladder and disorders of menstruation, uttara-vasti is necessary.¹

There are two instruments mentioned—one for application of oleaginous medicines to a sore and the other for washing a sinus with medicated lotions. Each consists of a tube and a leather bag. The tube is smooth and rounded and is shaped like a cow's tail.² It is six anguli long. The base is broad and admits a thumb, while the end is narrow and admits a pea. There is a circular projection or ring at a short distance from the end. The base is fitted tightly into a bag of thin leather.³

¹ वातदुष्टो व्रणोयस्तु रुचाश्चत्यर्थवेदनः ।

अधःकाये विशेषेण तत्र वस्तिर्विधीयते ।

मूत्राघाते मूत्रदोषे शुक्रदोषेऽश्मरीव्रणे ।

तथैवार्तवदोषे च वस्तिरप्युत्तरो हितः ॥

Suśruta Saṁhitā. IV. i.

² नाडी व्रणानां स्नेहप्रयोगार्थं प्रक्षालनार्थञ्च हे यन्त्रे आह यन्त्रे इत्यादि नाडीव्रणाम्यङ्ग-
क्षालनाय नाडीव्रणानामभ्यङ्गार्थं प्रक्षालनार्थञ्च षडङ्गुलं षडङ्गुलं दीर्घं, वस्तिर्यन्त्राकृतिं वस्ति-
नेत्राकारे वस्ते गोपुच्छाकारे * * * *

Vāgbhaṭṭa's Artha Saṁudāhṛti, I. xxv.

³ यन्त्रे नाडी व्रणाम्यङ्गं क्षालनाय षडङ्गुलं ।

वस्तिर्यन्त्राकृतिं मूलोऽङ्गुलं कलायत्तं ।

अयतः कर्णिके मूले निवृद्धस्य दुर्घर्षणी ॥ १८ ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv

To prevent the tube slipping out of the bag, an additional precaution is taken by tying a knot of thread over the leather covering the tube. For description of the bag, *vide infra*.

Śarṅgadharā¹ however says that the tube should have the thickness of the shaft of a vulture's feather and should admit a moong (Phaseolus Moong). It is eight aṅguli long.

Pālakāpya describes the tube for washing wounds of elephants to be made of copper, and shaped like the karontaka flower. It is sixteen aṅguli long.

In modern times, wound syringes are similarly used to wash the sore with medicated lotions.

For description of the tubes for vṛāṇa-dhupana or wound-fumigation, *vide infra*.

11. TUBULAR INSTRUMENTS FOR ASCITES.

Dākodara yantra or Canula.

It may be either metallic or manufactured from the cylindrical hollow calamus of a peacock's feather.² The tube is open at both ends and is of the same calibre throughout. Suśruta advises us to use a pipe of tin, or lead or a feather to drain the fluid, after the abdomen has been tapped.³

¹ ब्रणवक्षोस्तु नेत्रं स्यात् स्रक्कामटाङ्गुलीषितम् ।

सुद्रच्छिद्रगृध्रपचनलिकापरिणाहि च ।

Śarṅgadharā Saṁgraha, III. vi.

² द्विद्वारा नलिका पिच्छनलिका वा दाकोदरे । १८ ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv.

³ तत्र वृषादीनामन्यतमस्य नाडीद्विद्वारां पचनाङ्गौ वा संयोज्या दोषोदक-
भवसिञ्चेतौ नाडीमपहृत्य तैललवणेनाभन्य ब्रणवन्धेनोपचरेत् ।

Suśruta Saṁhitā, IV. xiv

Celsus describes a lead or copper canula for draining ascites.¹ Paul writes that the tip used to be bevelled off like a writing pen.² It was also employed in empyema.³ Albucasis⁴ mentions a tube of silver or copper or brass having a small hole at the bottom and three on its sides.

In modern times we use a metallic canula of similar shape for draining fluid in ascites.

12. TUBULAR INSTRUMENTS FOR HYDROCELE.

This is practically the same instrument described above. Suśruta⁵ mentions a tube or canula to drain the fluid after tapping the hydrocele with the vrihimukha śastra or trocar. The Greek surgeons did not describe the operation. They preferred the open incision to puncture.⁶ Rhases, however, describes the operation of puncturing the scrotum for hydrocele.⁷

13. TUBULAR INSTRUMENTS FOR URETHRAL STRICTURE.

Suśruta recommends gradual mechanical dilatation of the urethra by means of tubes made of iron, or wood, or lac, well-smeared

¹ Celsus, vii. 15 & ii. 10.

² Paulus Ægineta, Vol. II. VI. L. Syd. Soc. Ed.

³ Hippocrates, ii. 259.

⁴ Albucasis, Chirrug, ii. 54.

⁵ मूत्रजां स्वेदयित्वा तु वस्त्रपट्टेन वेष्टयेत् ॥

सेवन्त्याः पार्श्वतोऽधस्ताद्विध्यैर्हीहिमुखेन च ।

अथात्र हिमुखां नाडीं दत्त्वा विस्त्रावयेद्भिषक् ॥

Suśruta Saṁhitā, IV. xix.

⁶ Paulus Ægineta, VI. lxii.

⁷ Rhases, Cont. xxiv.

with ghee.¹ He advises us to use the same tube for three consecutive days, then another of larger calibre for three days more, and so on, till the canal be fully dilated. He reserves External Urethrotomy as a last resource.²

14. TUBULAR INSTRUMENTS FOR RECTAL STRICTURE.

Suśruta similarly describes gradual dilatation of stricture of the rectum, using a higher number of dilators after the lapse of three days until the desired effect is attained.³

¹ (a) निरुद्धप्रकाशे नाडीं लौहीसुभयतोमुखीं ॥

दारवी वा जतुक्तां घृताभ्यक्तां प्रवेशयेत् ।

परिषेक वसामञ्ज शिशुमारवराहयोः ॥

चक्रतैलं तथाथोज्यं वातघ्नप्रत्यसंयुतं ।

ब्राह्मन्नाहत् स्थूलतरां सम्यङ्नाडीं प्रवेशयेत् ॥

श्रोतोविषहयेदेवं क्षिग्धमन्नञ्च भोजयेत् ।

भिलावा सेवनीं मुक्तां सद्यःचतवदाचरेत् ॥

Suśruta Saṁhitā, IV. xx.

(b) निरुद्ध प्रकाशे नाडीं द्विसुखीम् कनकादिजम् ।

क्षिग्धमन्ना चतुष्पदादिस्नेहेन परिषेचयेत् ।

तैलीन वा वचदारुकल्कैः सिद्धेन च ब्राह्मन्ना ॥

पुनः स्थूलतरा नाडीं देया श्रोतोविषहये ।

... ..

... .. रुद्धगुदेऽप्येव क्रियाक्रमः ॥

Cakradatta, Kṣudraroga Cikitsā.

See also Yogaratnākara, P. 368, where these verses are quoted.

² See I (a). संस्यार्थः—सेवनीं त्यक्ता शस्त्रेण वा सूचस्त्रोतः संकोचकारणं चर्मं विदारयेत् । तस्यापि द्वारस्याविपाटे मणिङ्गरमध्यं वं दारयेदिति ।

Commentary of Śrī Kaṇṭha in Vyākhyā Kusumāvālī
(Anandāśram Series), P. 406.

³ सन्निरुद्ध गुदे योन्या निरुद्धप्रकाशक्रिया ॥

Suśruta Saṁhitā, IV. xx.

There is no mention of solid bladder sounds in the Sanskrit medical books. But from the above descriptions, it seems beyond doubt that they had a set of dilators for stricture of the urethra and another set of dilators for stricture of the rectum. These dilators were tubes—either metallic or wooden—and had a regular gradation in the increase of their diameters. Cakrapāṇī mentions stricture dilators of gold.¹

In modern times we have also two sets of these instruments—urethral and rectal dilators, numbered in an ascending series according to the increased diameters of these instruments.

15. TUBULAR INSTRUMENTS FOR INJECTIONS INTO THE RECTUM.

Vasti yantra or Rectal Clyster.

Injections into the rectum are to be thrown by means of a tube with a membranous bag tied to its end. The tube is advised to be made either of gold, or silver, or lead, or copper, or brass, or bell-metal, or ivory, or horns, or glass, or precious stones, or wood or bamboo. It should be clean, smooth, strong, and tapering like a cow's tail, and should terminate in a smooth rounded bulb. The tube varies in length and circumference according to the age of the patient as follows:—

I. Caraka.²

Age.	Length of tube.	Opening at the end admits.
6 years ...	6 anguli ...	A moong
12 " ...	8 " ...	A pea
20 " and over ...	12 " ...	A small plum seed

¹ See foot note I (b), Page 124.

² सुवर्णरुप्यचपुतामरीति

कांस्थायसास्त्रिद्वमवेणुदन्तैः ।

नक्षेत्रिष्वर्षाणामपिभिश्च तेजैः

कार्याणि नेवाणि सुकर्णिकानि ॥

II. Suśruta.¹

Age.	Length of tube.	Part of tube in bag.	Circumference of tube.	Circumference at end.	Measure of injection.
1 year	6 anguli	1½ anguli	Little finger	Shaft of heron's feather.	2 añjali
8 "	8 "	2 "	4th "	Shaft of falcon's feather.	4 "
16 "	16 "	3½ "	3rd "	Shaft of peacock's feather.	8 "
50 "	12 "	3 "	Pulp of thumb	Admits a plum stone.	12 "
70 "	Same as that of the 16th year.				

षड्द्वादशाङ्गुलं सञ्चितानि षड्विंशतिद्वादशवर्षजानाम् ।

स्युर्मुद्गकर्कस्युः सतीनवाहिच्छिद्राणि वर्यापिहितानि चापि ॥

यथाययोऽङ्गुष्ठं कनिष्ठकाभ्यां मूलाययोः स्युः परिणाहवन्ति ।

चञ्जुनि गोपुच्छसमाकृतौनिःस्रव्यानि च स्युर्गुडिकामुखानि ॥

स्यात् कर्षिं कैकायं चतुर्थभागे मूलान्निने वसि निवन्धने हे ।

जारद्वयोमाहिषहारिणो वा स्याच्छौकरो वसिरजस्य वापि ॥

दृढसगुर्नष्टशिरो विगन्धः कषायरक्तः सुष्टुः सुगुडः ।

दृणां वयोवीच्य यथानुरूपं नेत्रेषु योज्यस्तु सुवज्रसूत्रः ॥

Caraka Saṁhitā, VIII. iii.

Also quoted in Cakradatta, Anuṣaṅgādhikāra.

¹ तत्र सांवत्सरिकाष्टद्विष्ट वर्षाणां षड्दशङ्गुलं प्रमाणानि कनिष्ठिकानामिका मध्यमाङ्गुलि परिणाहययेऽध्यङ्गुलाई तृतीयाङ्गुलं सन्निविष्ट कर्षिकानि कङ्कशेन वर्द्धिपत्र नाडी-तुल्यं प्रवेशानि मुद्रमाषकालायमाव स्रोतांसि विदध्यान्ने चापि तेषु त्वास्थापनाद्रव्यं प्रमाणमातुर हस्तसन्निनेन प्रष्टनेन सन्निती प्रष्टतौ द्वौचलारोऽष्टौ विधेयाः ।

भवति चात्र ।

वर्षोत्तरेषु नेत्राणां वसिमानस्य चैव हि ।

वयोवलशरीराणि समीच्य वर्द्धयिषिं ॥

षड्विंशतिरुद्धं द्वादशाङ्गुलं मूले ङ्गुष्टोदर परिणाहमये कनिष्ठिकोदर परिणाहमये त्रङ्गुल-सन्निविष्ट कर्षिकं गृध्रपत्रनाडीतुल्यं प्रवेशं कोलास्थिमात्रं छिद्रं क्लिन्नकलायमात्रं छिद्रमित्येकं । सञ्चानिमूले वसिनिवन्धनार्थं द्विकर्षिकानि । आस्थापनं द्रव्यं प्रमाणं तु विहिता द्वादश प्रष्टताः । समनेसूत्रं नेत्रं प्रमाणमेतदेवद्रव्यं प्रमाणान्तु द्विरष्टवर्षवत् ।

तत्र नेत्राणि सुवर्णरजततामसयोरीति दत्तशङ्कसन्निषितरुसारमशानि स्रव्यानि दृढानि गोपुच्छाकृतौचञ्जुनि गुटिका मुखानि । वसत्याश्वाङ्गुलानां स्रव्यो नाति वज्रला दृढाः प्रमाणावन्तो गोमहिषवराहजोरश्वाणां ।

III. Vāgbhaṭa II.¹

Age. (years).	Length of tube.	Opening at base admits.	Opening at end admits.
Under 1	5 aṅguli	1 finger	A moong (phaseolus moong).
1 to 6	6 „	1½ „	A masha (phaseolous Rox).
7 to 11	8 „	2 „	A kalāya (pea) (pinus sativum).
12 to 15	9 „	2½ „	Boiled pea.
16 to 20	12 „	3 „	A śrṅgalakoli (zizyphus cenoplia).
over 20	varies according to the age, strength and size of the patient; but the orifice at the base of the tube need not be wider.		

नेत्रलामि हितनाडी नलवंशास्थि सम्भवा ।

वस्त्रालामि हितं चर्मं सूक्ष्मं वा तान्त्रवं घनम् ॥

वस्तिं निरूपदिग्धन्तु शुद्धं सुपरिमाजितं ।

सुद्विगुह्यत ह्रीनच्च सुहृः स्नेहविमर्दितं ।

नेत्रमूले प्रतिष्ठाप्य नुञ्जन्तु विद्वताननम् ॥

Suśruta Saṁhitā, IV. xxxv.

¹ तयोस्तु नेत्रं हेमादि धातु दार्व्यस्थि वेनुजं ।

गोपुच्छाकारमच्छिद्रं श्लक्ष्णं गुडिका मुखं ॥

ऊनेऽब्दे पञ्चपूर्णेऽभिन्नासतभ्योऽङ्गुलानि षट् ।

सप्तमे सप्त तान्यष्टौ द्वादशे षोडशे नव ।

द्वादशैव परं विंशद् वीच्चा वर्षान्तरेषु च ।

वयो बल शरीराणि प्रमाणमभिवद्ध्यते ॥

साङ्गं येन समंमूले स्थौल्येनाग्रे कनिष्ठया ॥

पूर्णेऽब्देऽङ्गुल मादाय तद्वर्द्धं प्रवर्द्धितं ।

चङ्गलं परमं छिद्रं मूलेऽग्रे बद्धते तु यत् ।

सुद्वं माषं कलायन्तु खिन्नं कर्कशकं क्रमात् ॥

मूलं छिद्रं प्रमाणेन प्राल्ते घटितं कर्णिकं ।

वर्त्याय पिहितं मूले यथास्वं द्वाङ्गुलान्तरं ।

कर्णिका द्वितयं नेत्रे कुर्यात् तच्च च योजयेत् ॥

अजावि महिषादीनां वस्तिं सुचदितं दृढं ।

कषाय रक्तं निच्छिद्रं यन्नि गन्ध शिरं तनुं ।

यथितं साधुसूत्रेण मुखं संस्थाप्य भेषजं ।

वस्त्राऽभावेऽङ्गुपादं वा न्यसेद्वासीऽथवा घनं ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xix.

Cakradatta¹, Śārṅgadhara and Bhāva Mīśra² follow Caraka as regards measurement. Kharanāda³ also gives a similar description.

¹ See foot note 2, Page 125.

² नेत्रं कार्यं सुवर्णादिधातुभिश्चक्षेत्रभिः ।
 नलैर्हन्तैर्विषासायैर्मणिभिर्व्या विधीयते ॥
 एकवर्षात् षड्वर्षं यावन्मानं षडङ्गुलम् ।
 ततो द्वादशकं यावन्मानं स्यादष्टसंमितम् ॥
 ततः परं द्वादशभिरङ्गुलैर्नचदीर्घता ।
 सुद्राहिद्रं कलायामं छिद्रं कोलास्थिसन्निभम् ॥
 गोपुच्छसन्निभं मूले स्थूलं तस्मात् क्रमात् कृशं ।
 यथासंख्यं भवेन्नेत्रं श्लक्ष्णं गोपुच्छसन्निभम् ॥
 चातुराङ्गुष्ठमानेन मूले स्थूलं विधीयते ।
 कनीष्ठिकापरीणाहमये च गुटिका मुखे ॥
 तन्मूले कर्णिके द्वे च कार्ये भागाच्चतुर्थकात् ।
 योजयेत् तत्र वस्त्रिंश्व वस्त्रिंश्वविधानतः ॥
 स्रग्जशूकरगवां महिषस्यापि वा भवेत् ।
 भूचकोशस्य वस्त्रिंशु तदलाभि च चर्मणः ॥
 कषायरक्तः सुष्टुद्वस्त्रिः स्निग्धो दृढोद्भितः ।
 व्रणवस्त्रेभ्यो नैव स्यात् श्लक्ष्णमष्टाङ्गुलीन्मितम् ॥
 सुक्ष्मच्छिद्रग्रपचनलिकापरिणाहि च ।

Śārṅgadhara Saṁgraha, III. v.
 Bhāva Prakāśa, I. ii.

³ वस्त्रिनेत्रस्य शुक्लं सङ्घट्टङ्गुलिकासुखम् ।
 भवेद्गोपुच्छसंस्थानं सुप्रवाहं विकर्णिकम् ।
 या विभागप्रणयने मर्यादा कर्णिका भवेत् ।
 द्वे कर्णिके चोपरिष्ठाहस्राधारेऽथवान्तरे ।
 साङ्घट्टकपरीणाहं मूलं नेत्रस्य शस्यते ।
 मध्यं त्वनामिकातुल्यमथ तुल्यकनिष्ठिकं ।
 स्त्रे नाङ्गुलि प्रमाणेन दैर्घ्यं स्याद् द्वादशाङ्गुलम् ।
 कर्कशं प्रवहच्छिद्रं श्रेष्ठमन्यदायावयः ।

Hārīta¹ advises us to use a bamboo tube four aṅguli long, which is to be introduced into the rectum up to two aṅguli.

As a general rule, Caraka writes that the broad and the narrow ends of the tube are to be equal to the patient's thumb and little finger respectively, in circumference. The orifice at the end of the tube is to be kept closed by a wick, so that no foreign body may enter the lumen of the tube to occlude it. The plug may be easily removed when the tube is required for use, and then replaced.

Towards the narrow end of the tube is a projection or ring at a distance of about two aṅguli from the extremity. The height of the projection varies with the size of the tube at the base. It acts as a bar to the further introduction of the tube inside the rectum than required. Towards the base are two similar projections, two aṅguli apart from each other. To the one near the base is firmly tied the leather bag, so that the tube may not slip away suddenly during forcible compression of the bag. The other is meant to afford a firm grasp by the surgeon, so that the tube may not move during its introduction into the rectum. These projections are to be made of thread or a piece of cloth and are to be so shaped as to resemble the end of the proboscis of an elephant.

As regards the leather bags, they are recommended to be

विंशद्वादशषड्वर्षे द्वादशाष्टषडङ्गुलम् ।

कर्कशं सतीनायमुखं विद्रवहम् ॥

Kharanāda quoted in Sarvāṅga Sundarī, I. xix.

¹ चतुरङ्गुलां वेणुमयीं नाडीं प्रतिलक्षणं कृत्वा त्वया वस्त्रप्रतिकर्मं कुर्यात् । * * *

गुदाभ्यन्तरे द्वादङ्गुलमात्रं नाडी सञ्चारयेत् सुधीः ।

Hārīta Samhitā, V. iii.

made of the bladder of cows, or buffaloes, or hogs, or goats, or lambs. The bladder is to be well cleaned first with lime and water, so that no unpleasant smell may be emitted by the decomposition of its muscular tissue, then dyed red with *Mañjiṣṭhā* (*Rubia Cordifoliatum*) or with *Haritakī* (*Terminalia Chebula*, Retz.) and thoroughly dried. The bags are recommended to be soft, durable, entire and capacious. If the bladders of these animals are not available, the bags are to be manufactured from a frog's skin, or the peritoneum (one-fourth part would suffice) of any beast, or a piece of leather or a piece of very thick cloth. The size of the bag varies according to the age of the patient. It is to be firmly tied over the first projection at the base of the tube.

In the *Siddhisthāna* Chapter XI of the *Caraka Saṁhitā*,¹ there is a passage showing that veterinary medicine was well-known to the ancient Hindus at a very early period. This portion was edited by *Dr̥dhavala* and it is impossible to decide whether the passage refers to *Agniveśatantra* or not. It runs as follows:—
“Then the disciples asked: ‘How are clysters to be made in cases of animals such as elephants, camels, cows, horses, lambs and goats?’ To this, the sage *Ātreya* explained the clysters for

¹ अष्टच्छदेनं सचवस्तिमव्रवीत् विधिञ्चतस्याह पुनः प्रचोदितः ।

अजाविकेसीस्य गजोद्वयोर्वा गवाश्वयोर्वस्तिमुशान्तिमाहिषम् ॥

अजाविकादन्तमुवस्तिमुत्तरं वदन्ति वस्तिं विपरीतरूपम् ।

सुवस्तिमष्टादशशोऽङ्गुलं तथैवनेत्रञ्च दशाङ्गुलं क्रमात् ॥

गजोद्वगोऽन्त्राव्यजवस्तिं सम्यै चतुर्थभागे च सक्पर्णिकं वदेत् ।

प्रस्थस्त्वजाव्योर्हि निरुहमात्रा मवाद्विषु द्विविगुणो यथा वलम् ।

निरुह उग्रश्च तथाद्वकद्वयं गजस्य द्विस्त्रिनुवासनेऽष्टमः ॥

animals in the following manner. The leather bag of the vasti-yantra should be made of a buffalo's bladder for goats, lambs, elephants, cows, camels and horses. The vasti for these animals is known as suvasti and uttara-vasti as uttara-suvasti. The tube of the suvasti should be eighteen aṅguli long for elephants and camels, sixteen aṅguli for cows and horses, and ten aṅguli for goats and lambs. Like the vasti yantra used for men, it should have a projection at the junction (of the tube with the bladder) and another at the fourth division of the tube from the end."

In the Aśvavaidyaka¹ the tube for the horse is thus described: "The tube should be made either of wood, or metals, or horn, or bamboo, or reeds. Its length should be twelve aṅguli and circumference six aṅguli. The wise surgeon should make the tube of such a calibre as to allow a plum seed to pass through it easily. It should be straight, polished and tapering from the base. At a distance of four aṅguli from the end of the tube, a projection should be raised, while for tying the leather bag firmly to the tube, two projections ought to be constructed at the base".

Pālakāpya² describes the rectal clysters for elephants. He advises that these are to be made either of wood or bamboo. The end is bulbous and the surface smooth. The length

¹ काष्ठैर्दण्डैर्योमिश्च शङ्खवंशनलादिभिः ।

द्वादशाङ्गुलीर्धन्तु परिणाहे षडङ्गुलम् ॥

कोलास्थिमावच्छिद्रन्तु कुर्यान्निर्ध्वं विचक्षणः ।

मूलादनुक्रमं शृण्वन्मृण्मन्तु विशेषतः ॥

त्यक्त्वाङ्गुलानि चत्वारि कर्षिकान्तस्य कारयेत् ।

पुटकस्यप्रवन्थाय मूले हे चापि कर्षिके ॥

Aśvavaidyaka, XVI. vs. 2—4.

² Pālakāpya's Hasti-Āyurveda, Sec. IV. Ch. V.

length of the tube varies, the most convenient being sixteen aṅguli for men and sixty-eight aṅguli for elephants. The projections at the base of the tube should be twelve aṅguli high. He describes in detail the method of introduction, position of the elephant, etc.

Dr̥dhavala advises us to reject the following eight kinds of tubes and eight kinds of bags¹ :—

I. Tubes—

1. Hrasva or too short : For the injection does not reach the proper place.
2. Dirgha or too long : For the injection passes beyond the proper place.
3. Tanu or too thin : The injection can not pass through the tube easily and so the bag may burst.
4. Sthūla or too thick : The tube pulls the mucous membrane of the rectum and anus backwards and forwards during its entrance and exit.
5. Jirṇa or old, weak and delicate : The tube may break inside the rectum during its introduction and so cause injury to the gut or anus.

¹ ऋक्षं दीर्घं तनुस्थूलं जीर्णं शिथिलवन्धनम् ।
 पार्श्वच्छिद्रं तथा वक्रमष्टौ नेत्राणि वर्जयेत् ॥
 अत्रात्रातिगतिचोभकर्षणचणनस्रवाः ।
 गुदपौड़ा गतिजिह्वा तेषां दोषा यथाक्रमम् ॥
 मांसलच्छिद्रविषमस्थूलजालकवातलाः ।
 छिन्नः क्लिन्नश्च तानष्टौ वस्तीन् कर्मसु वर्जयेत् ॥
 गतिवैषम्यविस्त्रलस्राव्यदौयाह्ननिस्रवाः ।
 फेनिलच्युतधार्थ्यलं वस्तेः स्याद् वस्तिदोषतः ॥

6. Śīthilabandhana : The tubes do not fit the bags well, so during compression of the bags, the injected fluid runs out by the side of the tube.
7. Pārśvacchidra or leaky : Having slit on the side, the tube may injure the soft parts by rubbing against them.
8. Bakra or curved : The motion of the injected fluid would be curvilinear. It will strike a side of the rectum and so would not go inside the gut.

II. Bags—

1. Māṃsala or fleshy : The bag emits bad smell.
2. Chidra or leaky : The injection escapes outside.
3. Viṣama or uneven : Parts are unequally compressed and so the injection does not issue in a forcible jet.
4. Sthūla or thick : It is difficult to grasp the bag and so it can not be forcibly compressed.
5. Jālaka or having a network : The injection comes out.
6. Vātala or hollow, airy and incompressible : If air can not be expelled out, froth forms in the injection ; and so air is pumped into the rectum.
7. Chinna or torn : The injection flows down.
8. Klinna or moist : The injection can not be forced-out.

Suśruta mentions eleven defects of tubes and five defects of bags of the Vasti yantra.¹

¹ अतिस्थूलं कर्कशमवनतमणुभिन्नं सन्निवृष्टं विप्रकृष्टं कर्षिकं सूक्ष्मातिच्छिद्रमतिदीर्घं-
मतिह्रस्वमित्येकादश नेत्रदोषाः । वहलताल्पता सच्छिद्रता प्रक्षीर्णता दुर्विद्धतेति पञ्चवस्ति
दोषाः ।

I. Tubes—

- | | | |
|------------------------|---------------------|---|
| 1. Atisthūla: | Too thick. | } Such tubes injure the rectum and so cause pain. |
| 2. Karkaśa: | Rough. | |
| 3. Avanata: | Curved. | |
| 4. Anu: | Too thin: | } It becomes useless to inject fluids into the rectum. |
| 5. Bhinna: | Broken. | |
| 6. Sannikṛ-ṭa Karnika: | Projection near? | |
| 7. Viprakṛṣṭa Karnika: | Projection distant? | } Injure the rectum which bleeds. |
| 8. Sūkṣma: | Small orifice. | |
| 9. Atihrasva: | Too short. | } It becomes difficult to inject as the fluid comes out. |
| 10. Atichidra: | Large orifice. | |
| 11. Atidirgha: | Too long. | } Too much fluid passes into the rectum and so pain is complained of. |

II. Bags—

- | | | |
|-----------------|-------------------|--|
| 1. Vahalatā: | Fleshy. | } It is difficult to tie the bags over the tubes properly. |
| 2. Prastīrnatā: | Large. | |
| 3. Sacchidratā: | Perforated. | } No fluid can be forced into the rectum and so the instrument is useless. |
| 4. Durviddhatā: | Difficult to tie. | |
| 5. Alpatā: | Small. | |
- Small quantity of fluid passes into the rectum.

गुदे भवेत् चतुर्ध्वं च साधनं पूर्ववत् क्षुत् ।

आसन्नं कर्णिके नेत्रे भिन्नेऽप्यौ वायुपाथकः ॥

अवसेको भवेद्वस्त्रादोषान्निवर्जयेत् ।

प्रकृष्टं कर्णिके रक्तं गुदमर्शं प्रपीडनात् ॥

चरत्यत्रापि पित्तघ्नो विषिर्वस्त्रिष्य पिच्छिलः ।

ऋन्नेत्युच्चोत्तसि च ह्येवो वस्त्रिष्य पूर्ववत् ॥

प्रत्यागच्छन्तः कुर्याद्भोगान्वसि विघातजान् ।

दीर्घं महाक्षौतसि च ज्ञेयमत्यवपीडवत् ॥

प्रक्षीर्णं वहले चापि वसौ दुर्वज्ज दोषवत् ।

वसावत्येऽत्यता वापि द्रव्यस्याल्पगुणा मताः ॥

दुर्वज्जं चापि भिन्ने च विज्ञेयः भिन्नं नेत्रवत् ।

16. UTTARA-YASTI.

Urethral, Vaginal and Uterine Tubes.

Injections into the urethra and vagina are also recommended to be thrown in by similar contrivances: the tubes being adopted in length and circumference to the length and breadth of the passages for which they are intended.

1. Tubular Instruments for the Urethra.

The tubes intended for applying medicines into the male urethra is recommended to be twelve aṅguli long. Sūśruta¹ advises us to use tubes fourteen aṅguli long. It is to be made of gold and is called Puṣpanetra. Its circumference is equal to that of a stalk of flower of Jātī (*Jasminum Grandiflorum*) or Mālatī (*Echites Crayophyllata*, Rox.), and the lumen of the tube allows a mustard seed to pass through it. It is provided with an annular projection just at the central part. Caraka² says that

¹ वस्त्रेक्षरसञ्ज्ञस्त्विति वच्चास्यतः परं ॥

चतुर्दशाङ्गुलं नेवमातुराङ्गुलं सम्मितम् ।

मालतीपुष्पहन्तायं क्षिद्रं सर्वप निर्गमम् ॥

मेढ्रायामसमं केचिदिच्छन्ति खलु तद्विदः ।

क्षेह प्रमाणं परमं कुक्ष्यात् प्रकौशितः ॥

पञ्चविंशदधोमात्रां विदध्याद् बुद्धिकल्पिताम् ।

निविष्टकर्णिकं मध्ये नारीणां चतुरङ्गुलम् ॥

मूत्रस्रोतः परीणाहं सुदृढं वा हि दशाङ्गुलम् ।

तासामपत्यमार्गे तु निदध्याच्चतुरङ्गुलम् ॥

द्वाङ्गुलं मूत्रमार्गे तु कन्यानाम् त्विकमङ्गुलम् ।

वितेयं चाङ्गुलं तासां विधिवच्चरति यथा ॥

Sūśruta Saṁhitā, IV. xxxvii.

² पुष्यनेत्रश्च द्वैमं स्यात् सूक्ष्मौत्तरवस्तिकम् ।

it has two projections while Vāgbhaṭa¹ describes three. The bag is to be made of goat's bladder. A probe is first passed into the urethra to examine its condition and then the tube is introduced up to the length of six aṅguli. The bladder which contains the injection and which is tied tightly round the tube, is then compressed to force the fluid into the urethra. The tube of course, varies in size according to the dimensions of the organs of generation.

For the female, the puṣpanetra is described to have the length of ten aṅguli. The projection is at a distance of four aṅguli from the base. The circumference of the tube varies according to the width of the urethral canal. The calibre of the tube allows a moong to pass through it.²

जातीपुष्पस्य हन्तेन समं गोपुच्छसंस्थितम् ।

रीप्यं वा सर्षपच्छिद्रं द्विकर्णं द्वादशाङ्गुलम् ॥ ४६ ॥

Caraka Saṁhitā, VIII. ix.

¹ आतुराङ्गुलमानेन तन्नेव द्वादशाङ्गुलं ।

हन्तं गोपुच्छवत् मूलमध्ययोः कृतकर्णिकं ।

सिद्धार्थकप्रवेशार्थं क्षणां हेमादि सन्धवं ।

कुन्दाशमारमुमनः पुष्पहन्तोपमं दृढं ।

तस्य वन्तिर्दुलघुर्मावा शक्तिर्विकल्पवा ॥

* * * *

नेव दशाङ्गुलं सुद्वप्रवेशचतुरङ्गुलं ।

अपत्यमार्गे योज्यं स्याद्दशाङ्गुलं मूलवर्त्मनि ॥

मूलकृच्छ्रविकारिषु बालानां स्वेकमङ्गुलम् ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xix.

² पुष्पनेव प्रमाणानु प्रमदानां दशाङ्गुलम् ।

मूलस्रोतः परीषाहं मूलस्रोतोऽनुवाहि च ॥

गर्भमार्गे तु नारीणां विषेयं चतुरङ्गुलम् ।

दशाङ्गुलं मूलमार्गे तु बालायां स्वेकमङ्गुलम् ॥

Caraka Saṁhitā, VIII. ix

Catheters.

It is curious to find no description of so important an instrument as the catheter. Injections were thrown into the urethra but the tube used was always a straight one, having the length of six *āṅguli*; so it could not possibly have reached the bladder in the male, and nowhere has the claim been put forward for it to have done so. The tube might have served well for the females. The female catheter of the Greeks, as preserved in the Naples museum, is 0.98 mm. long and is straight throughout (Milne).

In the *Atharvaveda Samhitā*,¹ however, we find a hymn, unmistakably alluding to the use of catheter in ancient times.

Against obstruction of urine with a rod.

"This hymn is intended to be 'used in a rite for regulating the flow of urine'. The reed implies some primitive form of a fistula urinaria, the *vastīyantra* (one of the *nāḍīyantrāṇi*) of the late physicians—who however do not appear to have made frequent uses of it".

* * * * *

6. What in thine entrails, thy (two) groins, what in thy bladder has flowed together—so be thy urine released, out of thee with a splash! all of it. (In the groin are two vessels located in the two sides affording access to the receptacle of urine).

7. I split up thy urinator, like the weir of a tank—so be thy urine released, out of thee, with a splash! all of it.

8. Unfastened (be) thy bladder orific, like that of a water-

¹ Book 1. 3. Whitney's translations and annotations.

holding sea—so be thy urine released, out of thee, with a splash ! all of it.

9. As the arrow flew forth, let loose from the bow,—so be thy urine released, out of thee with a splash ! all of it”.

2. Tubular Instruments for the Vagina.

Similarly injections were thrown into the vagina. The vaginal tube should be thicker than the urethral tube and in circumference should be equal to that of the little finger. It should be introduced into the vaginal canal up to a distance of four *āṅguli*, whereas into the urethra, the tube was allowed to enter up to a distance of two *āṅguli* only in the adults and of one *āṅguli* only in the girls.¹

3. The Uterine Tubes.

The *uttara-vasti* comprises the urethral syringe—male and female—and the vaginal and uterine clysters. No distinct uterine tube is described in the text books. But *Suśruta*² says

¹ द्वादशाङ्गुलं नेत्रं मध्ये च कृतकर्णिकम् ।

मालतिपुष्पहस्ताभञ्जिद्रं सर्षपनिर्गमम् ॥

* * * *

स्त्रीणां कनिष्ठिकास्थूलं नेत्रं कुर्याद्द्विशाङ्गुलम् ।

मुद्गप्रवेश्यं योज्यञ्च योज्यन्तश्चतुरङ्गुलम् ॥

चतुरङ्गुलं मूत्रमार्गे च सूक्ष्मं नेत्रं नियोजयेत् ।

मूत्रकृच्छ्रविकारेषु बालानामेकमङ्गुलम् ॥

*Sārāgadhara Samhitā, III. vii.
Bhāva Prakāśa, I. ii.*

² चर्द्धजान्त्रे स्त्रिये दद्यादुत्तानाथै विचक्षणः ।

कल्पतरुस्य कण्ठायै दद्यात् सुच्छदु पीडितं ।

द्विकर्णिकेन नेत्रेन दद्याद्योनिमुखं प्रति ।

गर्भाशय विग्रहार्थं स्नेहेन द्विगुणेन तु ।

अप्रत्यागच्छति भिषक् वक्तावुचरसंज्ञिते ।

that to apply *uttara-vasti* to a female, she is advised to lie supine, keeping her knees flexed and well raised. For a girl the quantity of injection is one *prasṛta*.

To purify the uterine cavity, apply a clyster of twice the quantity of oleaginous medicines, inside the vagina by means of a tube having three rings. If after the application, the oily medicine does not flow out, then apply a second clyster containing medicines of the group called *śodhana* or purifiers, into the rectum; or let the clever surgeon introduce a probe into the space of the clyster; or press under her navel deeply by his closed fist. As the object of the injection is to clean the cavity of the uterus, there can be no doubt that a uterine tube is referred to in the passage. Again the precautions recommended if the injections do not come back easily, point to a uterine tube to have been used, for injections into the vagina can not be delayed in coming out. The Hindu writers often confounded the intra-uterine and urethral injections with the vaginal clyster. *Caraka*¹ says: "The *uttra-vasti* is to be used for the females during the period of menstruation, for then the uterus, being in a condition fit for impregnation, has its mouth open and so can easily be reached by the injection." This shows that uterine medication to be the object aimed at by the clyster.

भूयो वस्तिं विदध्यातु संयुक्तां शौधनैर्गणैः ।

गुदे वस्तिं निदध्याद्वा शोधनद्रव्यं संभृतां ।

प्रवेशाद्वा मलितान्वस्तिहारमथैषणीम् ।

पीडयिष्याप्यधोनाभेर्वलिनीसरसुष्टिना ।

Suśruta Saṁhitā, IV. xxxvii.

¹ स्त्रीणाञ्चार्तवकाले तु प्रतिकर्मं तदाचरेत् ।

गर्भासना मुखं स्नेहं तदादेनै च्छपावता ॥

गर्भं योनिस्तदा शीघ्रं जिते गृह्णाति सार्वते ॥

Caraka Saṁhitā, VIII. ix.

The Greeks were no better, for Milne also complains: "It is difficult to separate ancient descriptions of injections into the vagina from those into the uterus, for the terms for the two parts are frequently interchangeable". Again he says: "It is probable that at other times under the heading of 'injections of the bladder', only irrigation of the urethra is meant".¹

18. TUBULAR INSTRUMENTS FOR INHALATIONS AND FUMIGATIONS.

The tubes for smoking were made, like the vasti tubes, of various metals, or glass or wood. Caraka² describes it as a straight tube having three pouches. The end of the tube is equal in diameter to that of a plum seed. Śārṅgadharma³ adds that a reed or bamboo pipe will also serve the purpose. It is described as a straight tube, the broad base of which admits the patient's thumb, while the narrow end, a plum seed. Suśruta⁴ describes the base

¹ Graeco-Roman Surgical Instruments, P. 107-8.

² चतुर्विंशतिकां नेत्रं खड्गलीभिर्विरेचने ।
 द्वाविंशदङ्गुलं स्नेहे प्रयोगे चाईमिष्यते ॥
 ऋजुविकोषफलितं कोलाख्यग्रमाश्रितम् ।
 वसिनेच समद्रव्यं धूमनेच प्रशस्यते ॥१६

Caraka Saṁhitā, I. १.

³ धूमनाडी भवेत्तव विखण्डा च विपर्विका ॥१०
 कनौष्ठिका परीणाह्वा राजमाषागमान्तरा ।
 धूमनाडी भवेद्दीर्घा श्मने रोगिणोऽङ्गुलैः ॥११
 चत्वारिंशन्मितैस्तद्वद्वाविंशङ्गिदौ स्मृता ।
 तीक्ष्णं चतुर्विंशतिभिः कासघ्ने षोडशेऽन्वितैः ॥१२
 दशाङ्गुलिर्वामनीये तथास्रादन्नपनाडिका ।
 कलायमष्टलम्बूला कुलत्यागमरन्ध्रका ॥ १३

Śārṅgadharma Saṁhitā, III. in.

⁴ तस्य वसिनेवद्रव्यैर्धूमनेचद्रव्याणि व्याख्यातानि भवन्ति । धूमनेवस्तु कनिष्ठिका
 परिचायनये कलायमात्रं स्रोतोमूलेऽङ्गुष्ठपरिणाहं धूमवर्चिं प्रवेश्य स्रोतोऽङ्गुलान्यष्ट चत्वारिंशः
 पञ्चोक्तिकाः द्वाविंशत् स्नेहेन । चतुर्विंशतिर्विरेचने । षोडशाङ्गुलं कासघ्ने वामनीये च ।

and end of the tube to be equal in circumference to that of the thumb and little finger respectively. The orifice should allow a common pea to pass easily through the tube. Vāgbhata¹ says that there are three pouches or dilatations of the tube, shaped like the half-open buds at equal distances from each other. The tube is supposed to consist of four equal parts. The first pouch is located at the end of the first part, the second and third pouches at the ends of the second and third parts respectively. Cakradatta² also describes it similarly.

Dr̥ḍhabala³ mentions another method of inhalation. He makes a paste of the medicines prescribed and smears it on a piece of silk cloth. This is then to be rolled round like a wick. This wick is to be dipped in ghee before use, and fire lit at one end, while the patient is to smoke it through the other end.

एते अपि कोलास्थिमात्रं च्छिद्रे भवतः । व्रणनेत्रमष्टाङ्गुलं व्रणधूपनार्थं कलायपरिमण्डनं
कुलस्थवाहिं स्रोत इति ।

Suśruta Saṁhitā, IV. xl.

¹ वस्ति नेत्रं समं द्रव्यं विकीर्णं कारयेदङ्गु ।

मूलाग्नेष्टु कोलास्थिं प्रवेशं धूमनेत्रकं ।

तौक्ष्ण्यं स्नेहनं मध्येषु त्रीणि चत्वारि पञ्च च ।

अङ्गुलीनां क्रमात् पातुः प्रमाणे नाष्टकानि तत् ॥६॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxi.

² ऋजुचिकीर्षफलितं कोलास्थयप्रमाणितम् ।

वस्तिनेत्रसमद्रव्यं धूमनेत्रं प्रशस्यते ।

सार्द्धस्त्र्यंशयुतः पूर्णो हस्तः प्रायोगिकादिषु ।

नेत्रे कासहरे त्र्यंशहीनः शेषे दशाङ्गुलः ॥

Cakradatta, Dhūmapānādhikāra.

³ प्रपुण्डरीकं मधुकं शार्ङ्गं च समनःशिलां ।

सरिचं पिप्पलीं द्राचामेलां सुरसमञ्जरीम् ॥

क्रत्वा वस्तिं पिवेद्भूमं चौमचेलानुवर्त्तिताम् ।

घृताक्रामनु च क्षीरं गुडोदकमथापिवा ॥

Caraka Saṁhitā, VI. xxii,

Both Caraka¹ and Śārṅgadhara² advise us to make tubes of medicines, the fumes of which are advised to be smoked in the following manner:—Powder the medicaments and make a paste; measure one karsa; take a smooth reed (*Saccharum sara*, Rox.) twelve *aṅguli* long. Apply the paste round the reed, for a length of eight *aṅguli*. Dry it in shade. Remove the reed, leaving a dried tube of the paste. When required for smoking, light one end of the tube with a burning wick and smoke through the other end.

Caraka³ describes another inhaler, which consists of two earthen basins (*soraba*) placed upon each other, their edges being pasted with flour. The upper one is perforated at the centre for the reception of one end of the tube, the patient puts the other

¹ पिष्ट्वा लिप्पेच्छरेषीकां तां वर्तिं यवसन्निभां ।

अङ्गुष्ठसन्नितां कुर्यादष्टाङ्गुलसमां भिषक् ॥

शुष्कां निगर्भां तां वर्तिं धूमनेत्रार्पितां नरः ।

क्षेप्त्वा तन्निग्रसंशुष्टां पिवेत् प्रायोगिकीं सुखाम् ॥ ६ ॥

Caraka Saṁhitā, I. v.

² अथेषिकां प्रक्षिपेच्च सुस्तण्डां वादयाङ्गुलाम् ।

धूमद्रव्यस्य कल्केन लिपश्चाष्टाङ्गुलः स्मृतः ॥

कल्के कर्षमितं लिखा क्वाया शुष्काच्च कारयेत् ।

इषिकामपनीयाय क्षेप्त्वा तां वर्तिमादरात् ॥

अङ्गारैर्दीपितां कृत्वा धृत्वा नेत्रस्य रन्मुके ।

वदनेन पिवेद्धूमं वदनेनैव संत्यजेत् ॥

नासिकाभ्यां ततः पीत्वा सुखेनैव वनेत् सुधीः ।

Śārṅgadhara Saṁgraha, III. ix.

³ मधूच्छिष्टं सज्जरसं घृतं सल्लकसंपुटे ।

कृत्वा धूमं पिवेच्छुद्धं वालं वा क्वायु वा गवाम् ॥

श्लोशाकवर्जमानानां नाडीं शुष्कां कुशस्य वा ।

Caraka Saṁhitā, VI. xxi.

end into his mouth for inhalation. The lower pot contains glowing charcoal of catechu (*Accacia catechu*. Linn.) wood, over which are put pills of necessary medicines. The tube is from eight to ten aṅguli long.¹ This inhaler is intended for phthisical subjects. It is useful for allaying cough and exciting emesis. This instrument is called *mallaka samputa* or *sorāba samputa* or a pair of earthen basins. In such an apparatus Caraka recommends us to put powders of cow's horn, hairs, nerves and ligaments, besides other medicines. *Susruta*², *Vāgbhata*³ and *Cakradatta*⁴ also describe it. *Śārṅgadharma*⁵ however reserves this instrument for fumigating wounds only.

The length of the pipe will vary according to the different kinds of smoking prescribed by the physician. There are five kinds of smoking narrated :—

1. *Śamana*, *madhya*, *proyogika* — medium.
2. *Brimhana*, *snehana*, *mṛdu* — mild.

¹ दशाङ्गुलीमितां नाडीं अथवाष्टाङ्गुलीमिताम् ।

शरावसंपुटच्छिद्रे कृत्वा जिह्वां विचक्षणः ॥

वैरेचनं मुखेनैव कासवान् धूममापिवेत् ।

Caraka Saṁhitā, VI. xxii.

² इतरयोर्व्यपेत धूमोद्धार स्थिरे समाहिते शरावे प्रक्षिप्य वर्ति मूलच्छिद्रेणात्येन शरावेण पिधाय तस्मिन्च्छिद्रे नेवमूलं संयोज्य धूममासेवेत् ।

Susruta Saṁhitā, IV. xl.

³ शराव सम्युटच्छिद्रे नाडीं न्यस्य दशाङ्गुलां ।

अष्टाङ्गुलां वा वक्त्रेण कासवान् धूममापिवेत् ॥

Astāṅga Hṛdaya Saṁhitā I. xxi.

⁴ अथवा सष्टतान् शक्तून् कृत्वा मल्लिकासम्युटे ।

नवप्रतिश्रयायवतां धूमं वैद्यः प्रयोजयेत् ॥

Cakradatta, Nāsāroga Cikitsā.

⁵ See foot-note 2. P. 145.

3. Recana, śodhana, tikṣṇa — strong.
 4. Kāsaghna — anti-cough.
 5. Vāmana — emetic.

So the length of the tube would vary thus—

1. Caraka¹

			Anguli.
In strong smoking	...	...	24
„ medium „	...	...	32
„ mild „	...	...	96

2. Suśruta.²

In medium smoking	...	...	48
„ oleaginous „	...	...	32
„ brain-sedative „	...	...	24
„ anti-cough or emetic „	...	...	16

3. Vāgbhaṭa.³

In strong smoking	...	...	24
„ medium „	...	...	32
„ mild „	...	...	40

4. Śārṅgadharma.⁴

In medium smoking	...	...	40
„ mild „	...	...	32
„ strong „	...	...	24
„ anti-cough „	...	...	16
„ emetic or wound-fumigation	...	...	10

FUMIGATION.

Similarly wounds are said to be purified by suitable medicinal fumigation. In the purification of wounds by fumigation, we get a glimpse of the antiseptic method of treatment in its

¹ See foot-note 2. P. 140.

² See foot-note 1. P. 141.

³ See foot-note 4. P. 140.

⁴ See foot-note 3. P. 140.

embryonic form. Suśruta¹ recommends the tube to be eight anguli long and to have the circumference of a common pea; and its orific should be of the size of a kulattha (*Dolichos biflorus*, Linn.). The fumes of medicated substances from the inside of any closed pot containing fire, pass out through the tube and are allowed to play on any sore to purify it. For this purpose two earthen pots—*sgrāha sampuṭa*—may conveniently be used as before. Śārṅgadhara² uses a tube ten anguli long and recommends us to use Nimba leaves (*Azadirachta Indica*) for wound-fumigation. As another instance of the application of the principles of antiseptic methods to practical therapeutics, we may mention the use of medicinal injections into the cavity of the uterus to rectify its morbid conditions.³

A similar instrument was used to fumigate the uterus and vagina in various diseases of these parts. "Fumigation", says Suśruta,⁴ "is to be applied to the vagina by burning the

¹ व्रणनेवमष्टाङ्गुलं व्रणधूपनार्थमकलायपरिमण्डलं कुलत्थवाहिस्रोतइति ।

Suśruta Samhitā, IV. xl.

स चौमयवसर्पिर्भिर्धूपनाङ्गैश्चधूपयेत् ।

Ibid. IV. i.

² दशाङ्गुलिर्वाग्मनीये तथासग्राह व्रणनाडिका ।

कलाय मण्डलस्यूता कुलत्थागमरन्ध्रका ॥१३

* * *

शरावसम्पुटे चिह्ना कल्कमङ्गारदीपितम् ॥१७

छिद्रे नैव निवेश्याथ व्रणान्तेनैव धूपयेत् ।

* * *

व्रणे निम्बवचाद्यश्च धूपनं संप्रशस्यते ।

Śārṅgadhara Saṅgraha, III. ix.

³ See foot note 2, P. 1318.

⁴ सर्भसङ्गे तु योषिं धूपयेत् कृष्णसर्पनिर्मोक्षेण पिच्छैतकेनवा ।

Suśruta Samhitā, III. x.

slough of a snake (Bungarus) or pinditaka (?) wood, in cases of obstructed delivery of the fœtus. Caraka¹ mentions fumigation of the vagina by burning Bhurjapatra (Betula Bhojpatra), glass, precious stones and the slough of a snake as one of the means for removing the placenta. To remove the after pains and difficulty in micturition and defæcation, Suśruta² advises us to fumigate the vagina. He recommends fumigation of the uterus with purifying medicines. In fumigating these parts, the Hindu surgeons desired a local action, and did not share in the belief, held by some of the Greek gynæcologists³ that "the uterus was an animal within the body which could wander about, being attracted by pleasant smells and repelled by disagreeable smells".⁴ The Arabs also did not believe uterus to be an animal. This method of treatment was well known to the Greeks; for Hippocrates⁵ writes that "fumigation with aromatics promotes menstruation and would be useful in many other cases, if it did not occasion heaviness of the head". He "directs us to take a vessel which holds about four gallons and fit a lid to it so that no vapour can escape from it. Pierce a hole in the lid, and into this aperture force a reed about a cubit in length so that the vapour cannot escape along the outside of

¹ भूर्जपत्रकाचमणि सर्पनिर्घाकैशास्रा योणिं धूपयेत् ।

Caraka Saṁhitā, IV. viii.

² कटुकालातुल्लतवेधन सर्षप सर्पनिर्घाकैश्या कटुतैलविमिश्रैर्योनिमुखं धूपयेत् ।

Suśruta Saṁhitā, III. x.

³ Aretæus. Morb. Acut. ii. 11.
Plato's Timæus.

⁴ Græco-Roman Surgical Instruments. P. 158.
Adan's Commentary on Paulus Ægineta, Vol. I. Bk. ii. P. 636-37.

⁵ See also in the Hippocratic treatises; as Nat. Mul. vii. 9; 1 Morb. Mul. vii. 1; 11 Morb. Mul. xi. 20, 21; Steril. vi. 3; Superfœt. ix. 3, x. 9, II.

the reed. The cover is then fixed on the vessel with clay."¹ Oribasius² and Soranus³ used similar instruments for the purpose.

DISINFECTION OF ROOMS, CLOTHES, etc.

Caraka⁴ says that if peacock's feather, bones of vaka bird, white mustard and red sandal wood, well powdered and mixed with ghee, be used in fumigation, the poison of a room, beddings, seats and clothes, is got rid of. Śārṅgadharā⁵ advises us to disinfect a sick room by the fumes caused by burning the following substances with ghee : peacock's feather, Nim leaves (Melia Azadirachta), Vrihati, pepper, asafoetida, Jotāmāṁsī (Nardostachys jotamansi), seeds of Sālmali (Bombax malabaricum), goat's hair, slough of a serpent, cat's faeces and ivory. Suśruta⁶ advises fumigation of a sick room for a surgical patient for

¹ Græco-Roman Surgical Instruments P. 150.

² Coll. xxi.

³ Soranus. xviii.

⁴ शिखिबर्हवलाकाभ्यानि सर्पपादन्दनं च घृतयुक्तः ।

धूमो गृहशयनासनवस्त्रादिषु शस्यते विषयुत् ॥५२॥

Caraka Saṁhitā, VI. xcv.

⁵ मयूरपिच्छं निम्बस्य पत्राणि हृत्पतीकलम् ।

मरिचं हिङ्गु मांसी च बीजं कार्पाससम्भवम् ॥

कागरोमादिभिर्धोकिं विष्टा वैङ्गालिकी तथा ।

गजदन्तश्च तदूर्ध्वं किञ्चिद्भूत विमिश्रितम् ।

गङ्गेषु धूपनं दत्तं सर्वज्वालयाद्वाजयेत् ।

पिशाचात् राधासञ्ज्ञिता सर्वज्वरहरो भवेत् ॥

Śārṅgadharā Saṁgraha, III. ix.

⁶ सर्पपादिघटताभ्यां सर्पिषा लवणं च ।

विरह्य कारयेद्धूपं दध्मराजमनन्धितः ॥

Suśruta Saṁhitā, I. xix.

ten days, morning and evening, after the operation has been performed.

15. TUBULAR INSTRUMENT FOR CUPPING.

Generally cow's horn is recommended for the purpose. It is eighteen aṅguli long, its base, forming the mouth of the instrument, is three aṅguli wide (Vāgbhaṭa).¹ It is conical in shape and the cone is said to be either curved or straight. The other end is pointed and perforated to the extent of allowing a mustard seed to pass through it. The narrow end, however, is made to assume the shape of a woman's nipple by winding thread round it. This facilitates the operation of suction by the mouth of a surgeon when the broad end is placed against any diseased area of the patient's body. Suśruta² mentions its use in blood-extraction. For extracting blood, the part must be scarified before its application; and to facilitate the operation, the part should be fomented (Yogarātnākara).³ After suction, the horn is to be covered by a piece of cloth or a small bladder of animals.

Vāllūki⁴ describes the śrīga thus :—"It is the horn of a white cow, half-moon shaped and seven aṅguli broad. The orifice

¹ वृङ्खलासं भवेच्छृङ्गं चूषयेत्पदादशाङ्गुलं ।

² अथेतिहार्थकच्छिद्रं सुनक्षत्रचुकाकृति ॥

Aṣṭāṅga Hṛdaya Saṁhita, I. xxv.

³ तदप्रच्छिते तनुवस्त्रपटलावनष्टेन शङ्केन शोणितमवसेचयेदाचूषणात् ।

Suśruta Saṁhitā, I. xiii.

⁴ स्वेदं विदध्यात्कुशलस्य नाड्या शङ्केन रक्तं बहुशः हरिष्व ।

Yogarātnākara Arbuda cikitsā.

⁵ विषाणः श्वेतगोरिन्दूचक्रं सप्ताङ्गुलायतम् ।

चिह्नान्तः पिचुपेशिकं योज्यं वातयुतेऽष्टजि ।

शङ्खे मूलवन्मूले किद्रमयेऽस्य सुद्वयम् ।

Vāllūki quoted in Nibandha Saṁgraha, I. xiii.

at the base is equal in circumference to that of the base of the thumb, while the end which is perforated admits a moong. This orifice at the end is closed by a wick of cotton". Cakra-pānidatta says that the horn should be three *āṅguli* long, and its orifice should be of the size of the stalk of an oleander flower.

Suśruta mentions a peculiar use of the horn¹: 'the extraction of an insect, cerumen, etc. from the middle ear by means of a horn or a probe. The horn was evidently used as an apparatus for suction, and Suśruta describes suction as one of the methods of extracting *śālya* from the body². Caraka³ uses horns and leeches to extract venom from a snake-bite; and Suśruta also refers to it. Besides the horns and cupping glasses, suction used to be accomplished by the surgeon's mouth.

Similarly Paul⁴ says that foreign bodies may be sucked out from the ears with a reed.

On the method of suction as a mode of treatment, Erichsen⁵ says:—"In former days, when duels with the small swords were of frequent occurrence, persons called "suckers" who were often the drummers of a regiment, were employed to attend the wounded combatants. This treatment which was conducted with a certain degree of mystery, consisted in sucking the wound till all blood ceased to flow, and then applying a pellet of chewed

¹ कर्णच्छिद्रे वर्त्तमानं कीटं क्षौद्रमलादि वा ।

शङ्खेणापहरेद्धीमानयथापि शलाकया ।

Suśruta Saṁhitā, VI. xxi.

² See foot-note 3, P. 108.

³ दंशं वा चुषेन्मुखेन यवचूर्णं पांशुपूर्णेन ।

प्रच्छेदन् विधजलौकः शङ्खैः स्वास्थं ततो रक्तम् ॥

Caraka Saṁhitā, VI. xxv.

⁴ Paul. VI. xxiv. and III. xxiii.

⁵ Erichsen's Surgery, Vol. 1, p. 341.

paper or a piece of wet linen to the orifice; in this way it would appear that many sword thrusts traversing the limbs were healed in a few days. The process of suction cleared the wound thoroughly of all blood, and drawing the sides into close apposition, placed the parts in the most favourable condition possible for union by primary adhesion. This practice might, perhaps, in many cases advantageously imitated in the present day by means of a cupping glass and syringe".

We also find Suśruta¹ describing a vasti yantra in the treatment of snake-bite. The tube is open at both ends, one end is applied to the part bitten by the snake, while to the other end the surgeon puts his mouth to suck out the poison. So this vasti yantra may be compared to the modern aspiration syringe.

Cupping instruments of metal or horn are still used by the Arabs in Kordofan and Sir R. Pasha² suggests that cupping is possibly borrowed by the west from the "most perfect physicians" the Arab. But now we are confident that the credit is due to the Hindus.

ALĀBU YANTRA.

Alābu or gourd is described to be made of the bark of the succulent fruit called alābu (*Lagenarea Vulgaris*). The pulp is scraped away and the bark is allowed to dry. Such a bark should be selected which is twelve and eighteen aṅguli in length and circumference respectively. Its mouth should be circular and should have a diameter of three or four aṅguli. A fire is to be lit inside it by burning a strip of dry cloth to produce a vacuum, and the

¹ प्रतिपूर्य सुखं वस्तिर्हि तमाचूषणं भवेत् ।

Suśruta Saṁhitā, V. v.

² Vide Third Report, Wellcome research laboratory at Gordon. P. 316.

instrument to be applied instantly to the intended part of the patient's body. It should be thus used to drain blood and phlegm from the body (Vāgbhata¹). In modern times cupping glasses are used for like purposes in a similar manner.

Vāllūki² describes the alābu yantra thus:—"The mouth of the instrument is well formed and has the diameter of four aṅguli. The body has the circumference of eight aṅguli and is well smeared with a paste of black mud. It is used for drawing out blood". In yogaratnākara³, śrīga and alābu are directed to be used for extraction of blood from accidental wounds. Caraka mentions the use of alābu for blood-extraction⁴.

Another instrument known as the ghaṭī yantra was used exactly in the same way⁵. It is said to consist of a brass pot

¹ स्याद्वाद्वाङ्गुलोऽलावुर्नाहे त्वष्टा दशाङ्गुलः ।

चतुर्वाङ्गुल इत्तास्यो दीनोऽन्नः श्लेष्मरक्तद्वयम् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv.

² अष्टाङ्गुलपरीणाद्वा चतुर्वाङ्गुलनालसन्निता सुमुखी कृष्णमृदालिप्ता तनुः श्लेष्टा रक्तावसेचनेऽलावुरिति ।

Vāllūki quoted in Nibandha Saṁgraha I. xiii.

सान्दर्पियाऽलाव्वा ।

Suśruta Saṁhitā, I. xiii.

³ छिन्ने भिन्ने तथा विङ्गे च ते सद्यो भिषगवरः ।

पट्टस्त्रेण संस्त्रेदं व्रणं व्रणविशारदः ॥

मुहुर्मुह्यथा दुःखं ना प्राप्नोति व्रणी नरः ।

अथवा दीप्यलवणपोटल्या स्नेदयन्मुहुः ॥

सन्तमया तप्तलोहपात्रसंयोगतः क्रमात् ।

दृष्टं रक्तं स्थितं चापि शङ्खलाव्वादिभिर्हरेत् ॥

Quoted in Yogaratnākara.

⁴ रुभिरागमार्थमथवा शङ्खलाव्वाभिराहरेत् रक्तम्—

Caraka Saṁhitā, VI. vii.

⁵ तद्दधटीह्रिवा गुल्म विलयोन्नमने च सा ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv.

which is still used commonly in India by all classes of people for drinking purposes. A fire should be lit inside as before and the ghaṭī applied to the surface of the body covered by a piece of cloth. It soon becomes firmly fixed and is thus used to raise abdominal tumours by means of it for purposes of correct diagnosis and also to effect its cure by subsidence. It is still used by the common people for the same ends.

Caraka¹ says:—"After the abdominal tumour has been relaxed or softened a little by fomentation and oleaginous application, it is to be covered by a piece of cloth. Then inside a small ghaṭī, a fire is to be lit by burning kuśa and other forms of grasses; the pot is then to be inverted and pressed over the part covered by the cloth. By this way, the tumour would be drawn upwards *i.e.* be made prominent. The ghaṭī is then to be taken away and after removing the cloth, and examining the extent of the tumour, it is to be incised. The different shapes of the incisions are called vimārga, ajapada and ādarśa. After incision, the tumour is to be pressed and rubbed with fingers. But the intestines and the heart must not be touched."

The extraction of blood by means of cups, has been practised from remote antiquity. It is interesting to note that both the Latin and Greek terms—*cucurbitula* and *κυκλῶ* signify a gourd;

¹ क्षिग्धस्त्रिन्नशरीराय गुब्बे शैथिल्यमागते ॥

परिविध्य प्रदीपांस्तु वल्ज्जानयवा कुशान् ।

भिषक् कुब्जे समावाप्य गुब्बं घटमुखं क्षिपेत् ॥

स गृहीतो यदा गुब्बस्तदा घटमथोद्धरेत् ।

वल्ज्जानरं ततः कृत्वा भिन्द्याद्गुब्बप्रमाणवित् ॥

and we know that Alābu also means a gourd. It is curious that the instrument should have been known to the ancient Hindus and Greeks by the same name.

Prosper Alpinus¹ (16th century) who wrote a book on the state of medicine in Egypt in his time, gives drawings of cupping horns he saw there. The horns were those of young bulls, highly polished, with a small hole at the top, by which the air was extracted by suction. To close the orifice a small tab of parchment was taken into the mouth and affixed by the tongue. The Egyptians also used cupping glasses, by suction and not by fire, a method evidently unknown to them.

Hero of Alexandria (B. C. 285—222) describes an interesting form of cup. Milne summarises his account thus :²—"The figure shows a cup of ordinary flattened form, divided into two by a diaphragm. Two tubes pass through the fundus, one passing through the diaphragm, the other not. Each of the tube is fitted with another which is open at its inner end but closed at its outer end and provided with a small cross bar to rotate it. Each of these sets of tubes is perforated by small openings. In the case of the short tubes, these are outside the cup, in the case of the long tube they are inside the cup, in the chamber shut off by the diaphragm. By rotating the piston these openings can be placed in apposition or not at will, thus forming valves. Open valve A by placing the hole in apposition. Close valve B by turning the holes away from each other. The inner chamber of the cup is now shut off except for the small hole A. Apply the mouth to the valve A, and suck the air out of the chamber. Close valve A. Apply the cup to the affected part. The advantage

¹ De Med. Aegyptiorum. Ed. 1541 lib. ii. ch. xii. p. 139.

² Græco-Roman Surgical Instruments, P. 104.

of this arrangement is that the affected part is not directly sucked upon by the mouth ; and the instrument is therefore more pleasant for the operator to use".

Celsus¹ thus describes the different kinds of cups :—"There are two kinds of cups, bronze and horn. The bronze is open at one end and closed at the other ; the horn, open at one end, as in the previous case, has at the other end, a small foramen. Into the bronze kind, burning lint is placed, and then the mouth is fitted on and pressed until it sticks. The horn is placed empty on the body, and then by that part where the small foramen is, the air is exhausted by the mouth, and the cavity is closed off above with wax and it adheres in the same way as before. Either may advantageously be constructed, not only of these varieties of materials but of another substance. If other things are not to be had, a small cup or a narrow mouthed jar will answer the purpose. When it has fastened on, if the skin has previously been cut with a scalpel, it extracts blood ; but if it be entire, air".

Paul² remarks that "those which are made with longer necks and broader bellies are possessed of a strong power of attraction." Both Oribasius³ and Aretaeus⁴ allude to them. Antyllus says that there are three materials of which cups are made—glass, horns, and bronze. A good number of such cups occur in the Naples, British and Scottish National Museums.

¹ Celsus. II. xi.

² Paulus Aegineta. VI. xii.

³ Med. Coll. VII. xvi.

⁴ De Morb. Acut. I. 10.

Albucasis¹ gives a full account of dry cupping. In applying the instrument he advises us either to create a flame in it, or to fill it with hot water. He gives drawings of various instruments of cupping. Rhazes speaks of applying a glass or a cupping instrument to draw off blood after leeching. The other Arabians give little additional information.

In modern times, cupping glasses are used in the same way as before.

V. Śalākā or Rods.

The rods, or pricker-like instruments, or probes are described to be of various kinds and are recommended to be used for various purposes²; so their length and circumference would vary according to some special uses required of them. Suśruta³ says: "There are two kinds of śalākā with their ends shaped like the head of the earthworm. They are used for probing abscesses and sinuses.

Two śalākā have their ends shaped like the wing of an arrow. These are to be used for raising any part for the purpose,

¹ Albucasis, *Chirurg.* ii. 98.

² नाडीप्रणालं शल्यगर्भानुसृत्यैतत्संज्ञितं गर्भं ।

करीरवात्नाडुलिभिरेषण्या वैपद्येद्विषक् ।

Suśruta Saṁhitā, IV. i

³ शल्यकायश्चाप्यपि नाना प्रकाराणि नाना प्रयोजनानि यथायोगपरिणाददोषाणि च तेषां गणद्वयदशरूपसंस्पर्शक वङ्गीशसुखं च हं हं एषणं स्युङ्गनक्षालनाङ्गरणार्थमुपदिश्यते । समुद्रदलमात्रसुखं हं किञ्चिदानताये कोतोऽगत्तशल्योद्गरणार्थं । घट्कापांसकृतौष्णोष्णानि प्रभाज्जनक्रियासु । शीणि दस्योक्तौलि खल्लसुखानि चारीषधप्रविधानार्थं । वीण्यशानि जाल्यवदनानि तौल्यकुणवदनानि चङ्कादिप्रकर्षस्वभिन्नं तानि । नासावुदङ्गरणार्थं सैकं कोलाव्यदलमात्रसुखं खल्लतीक्ष्णं । अग्ननाड्यैकं कलायपरिमण्डलमुभयतो मुकुणाय । सूत्रमागोविशोधनार्थं सैकं मानतोपुथरश्यायप्रमाणपरिमण्डलमिति ।

Suśruta Saṁhitā, I. vii.

after incision, of extracting any foreign body from it. Others assign to them the function of bringing together the lips of the wound caused by an abscess being opened and emptied.

Two *śalākā* have their ends shaped like the hood of a snake. They are useful for transferring any material from one part to another. Some of the simple probes used by the ancient Greek and Roman surgeons carried a single or double snake of *Æsculapius* at one end. But evidently it was meant as an ornamentation and served no useful purpose.

Two *śalākā* have their ends shaped like a fish-hook but are blunt. They are used for extracting any extraneous material from the muscles or bones”.

The last six kinds of *Suśruta* are practically the same as the six *śaṅku* of *Vāgbhaṭa*,¹ which are the following:—

The *śaṅku* are six in number. Amongst these, two are twelve and sixteen *aṅguli* long respectively. They are used for the purpose of raising a foreign body upwards from the wound.

Two varieties have their ends shaped like the hood of a snake. They are ten and twelve *aṅguli* long ; and they are used for the purpose of moving a foreign body in the wound in all directions.

Two varieties have the shape of a fish-hook—the ends resembling the stem of an arrow. These are used for the extraction of foreign bodies from the wound.

¹ शङ्खः षड्भौ तेषां षोडशद्वादशाङ्गुली ।

न्यूहनेऽहि फणावक्रौ द्वौ द्वादश दशाङ्गुली ॥

चालने शरपुङ्खा स्या वाह्यार्थे वडिशान्तिः ॥२५॥

Suśruta¹ mentions another pair of śālākā which have their ends shaped like a masūra pulse, and slightly curved ; these are used for the purpose of extracting a foreign body from the external outlets of the body such as mouth, nose, etc. They are eight and nine aṅguli long respectively.

SWAB PROBES.

Six śālākā are used for the purpose of wiping out the principal excretory canals of the body *viz.*, rectum, nose and ears.² Their ends are covered with cotton like a head-dress (pāḡḍī). The two śālākā intended for the rectum, have the lengths of ten and twelve aṅguli respectively for short and long distances. So the two varieties of probes for the ears are eight and nine aṅguli long, while the other two kinds of probes for the nose are six and seven aṅguli long respectively. Some commentators are of opinion that these six śālākā are meant for clearing abscesses.

For similar purposes the Greek and Roman surgeons used the spathomele or spatula probe. Priscianus³ writes : "First of all we must frequently wipe away the clots of blood from the nose

¹ See foot note 2, P. 155.

उभेगण्डूपदसुखे खीतभ्यः शल्यहारिणी ।

मसूरदलवन्त्रो द्वे स्यातामष्टनवाङ्गुली ॥२४

Aṣṭāṅga Hṛdaya Saṁhitā. I. xxv.

² कार्पास विहितोष्णीषाः शलाकाः षट्प्रसार्जने ।

पायावासान्न दूरायै द्वे दश द्वादशाङ्गुली ।

द्वे षट् सप्तङ्गुली भ्राणे द्वे कर्णोऽष्टनवाङ्गुली ॥२८॥

Ibid.

³ Priscianus, xiv.

with the end of a spathomele wrapped on the 'berry' with soft wool, and then occlude it by plugging with wool in the same way."

The use of probes, having the ends wrapped with wool, for wiping out discharge of pus from the ears of horse, is mentioned by Jayadatta Suri¹ in his Treatment of Horses.

SPoon-SHAPED PROBES.

Three probes are described to have their ends shaped like a khala or mortar with a conical cavity, and so they resemble a spoon. They are to be used for the purpose of applying caustic solutions, etc.²

Similarly cyathiscomele, which is a variety of spathomele in which the spatula is replaced by a spoon, is said to have been used by the Greek surgeons to mix, measure and apply medicaments. The specimens of these instruments occur in the Naples Museum. Sometimes the edge of the spoon is sharp and is recommended to be used as a curette. Scrivonius Largus directs us to use the spoon of an ear specillum for the application of caustics to hæmorrhoids.

¹ पूयस्त्रावेक्ष जानीयात् शोथमभ्यन्तरोद्गम् ।

पिबुना वेष्टयित्वा तु शलाकायं सनाहितः ॥

तेन कर्णान्तरे पूयं कर्षयित्वा विचक्षणः ।

पातितस्य सुवङ्गस्य पूरयेन्मधूधूसर्पिषा ॥

Āśvavaidyaka, Ch. 34, v. 2. and 3.

² See foot-note 2, P. 155.

NAIL-SHAPED PROBES.

Vāgbhata¹ describes three other probes for the same purpose. They are eight aṅguli long; their ends are bent and resemble in size and shape the nails of the third, fourth, and fifth fingers respectively.

Paul² mentions a nail-shaped probe in the treatment of bubonecele. But this was applied as a cautery and not for the application of medicaments. Nail-shaped cauteries are also referred to by Hippocrates³ in the treatment of recurrent dislocation of the shoulder-joint.

JĀMVOVAUṢṬHA PROBES.

Three probes are called Jāmvoṃvaṣṭha for their ends are shaped like the fruit of Jambul tree (*Eugenia jambolanum*).⁴ Three other śalākā have their ends shaped like aṅkuṣa or elephant driver's goad.⁵ They may be made of any length required

¹ अष्टाङ्गुला निम्नमुखा स्त्रिः चारिषच क्रमे ।

कनीनी-मध्यमाऽनामी-नखमान-समैर्मुखैः ॥

Aṣṭāṅga Hṛdaya Saṃhitā, I. xxv.

² Paulus Aegineta, VI. lxxv.

³ Hippocrates iii. 15.

⁴ See foot-note 2, P. 155.

शलाका जाम्बवीटानं चारिष्यी च पृथक् त्रयं ।

युष्मात् खूलान् द्वीर्षानां,

[Aṣṭāṅga Hṛdaya Saṃhitā, I. xxv.

⁵ See foot-note 2, P. 155.

For the diagram of the aṅkuṣa see Fergusson's Tree and Serpent Worship; Plate xxxiii. Sanchi. xxxvii. fig. I. and xxxviii. fig. 1 & 2.

by the surgeon. These six varieties are recommended for the purpose of applying caustic medicaments and the actual cautery.

Paul¹ mentions a gamma-shaped cautery in the radical cure of hernia. This cautery is shaped like the Greek letter Γ ; so it resembles the añkuṣa cautery of the Hindus. The añkuṣa is similar in appearance to the Greek letter.

One variety, which is used for the purpose of removing a tumour from the interior of the nasal cavity, has its end shaped like a khala or mortar, with sharp edges, and of the size of half the stone of the fruit of the jujube tree (*Ziziphus jujuba*)². Vāgbhaṭa³ mentions a similar probe for the purpose of applying actual cautery to a nasal tumour. Its end resembles in shape and size, a half of the stone of the fruit of the jujube tree.

This spoon-shaped probe of the Hindus is comparable to the curette like sharp cyathiscomele of the Greeks, noted before.

COLLYRIUM PROBES.

For the purpose of applying collyria to the eyes, a rod is mentioned having the length of eight añguli and the thickness of a pea. Its both ends are shaped like buds⁴.

The probes for applying collyria to the eyelids, should be six añguli long, with a rounded bulbous end. They may be made of gold, or silver, or copper, or iron, or stone. For the habitual use of collyria, a lead probe is prescribed. When medicines are directed

¹ Paul, VI. lxii.

² See foot-note 2, P. 155.

³ कौलास्थि दल तुल्या सा नासाश्चिर्बुद दाहकम् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxv.

⁴ See foot-note 2, P. 155.

to be applied not only to the lids but also to the conjunctiva, the finger is recommended as it is a softer and safer instrument. Again the probes would vary according to the nature of the collyria to be used. As for the application of lekhana collyrium, the probe should be made of copper and should be ten aṅguli long. The probe is advised to be made thinner at its middle to afford a firm grasp by the surgeon. The ends are shaped like buds. For applying ropana collyrium, a similar probe is to be used, but it should be made of steel; while for the application of a collyrium for the improvement of the visual strength, a probe made of gold or silver, and having the size and shape of a finger is recommended by Cakradatta.¹

Suśruta² likes a probe of steel, or bell-metal, or copper for lekhana collyrium; and of gold, or silver, or horn, for ropana and snehana collyria. The probe should be eight aṅguli long, and the eye is to be kept open and fixed by the left hand, while the right hand is to hold the probe, and so the collyrium is to be applied to the eye.

¹ दशाङ्गुला तनुर्मध्ये शलाका मुकुलानना ॥

प्रश्ला खिने ताम्बी रोपणे काललोहजा ।

अङ्गुलीव सुवर्णोत्था रूप्यजा च प्रसादने ॥

Cakradatta. Āschyotana Cikitsā.

² तेषां तुल्यगुणान्वेव विदध्याद् भाजनान्यपि ।

सौवर्ण्यं राजतं शङ्खं ताम्रं वैदूर्यकांस्यजं ॥

आयसानि च योन्यानि शलाकाश्च यथाक्रमं ।

वक्रयोर्ध्वकुलाकारा कलाय परिमण्डला ॥

अष्टाङ्गुला तनुर्मध्ये मुकुता साधुनियन्ता ।

औदुम्बरीश्मजावानि शारीरी वा हिता भवेत् ॥

Suśruta Saṁhitā, VI. xviii.

Śārṅgadharma¹ says: "The collyrium probe should be made of stone or metal. It should be eight aṅguli long and its ends must be made smooth and rounded like a common pea. For lekhaṇa collyrium, a copper, or iron, or stone probe is to be used, while for ropaṇa collyrium the tip of the finger is recommended for its softness."

Of the probes used by the Hindus for applying collyrium to the eyes, fortunately we possess a few specimens. Among the objects of interest found in the excavations at Bijnor, we find, "fourthly, one copper salai or instrument for applying antimony to the eye, similar to those found in the Bihat excavations."²

¹ सुखयोः कृष्टिता श्लक्षा शलाकाष्ठाङ्गुलीन्मिता ।
 अमृज्जा धातुजा वा स्यात् कलायपरिमण्डला ॥
 तासलोद्गमसंजाता शलाका लिखने मता ।
 सुवर्णरजतोद्भूता शलाका स्नेहने मता ।
 अङ्गुलीच सदुत्पेन कथिता रोपणे वृधैः ॥

Śārṅgadharma Saṅgraha. III. xiii.

Yogarātnākara. Eye Diseases. P. 823.

चिफल सलिलयोगे भङ्गराजद्रवे च
 हविषि च विषकल्के क्षीरे आजि मधूये ।
 प्रतिदिनमथ तप्तं सप्तधा सौसमेकं
 प्रणिहितमथ पश्चात् कारयेत् तच्छलाकाम् ॥
 सवितुरुदयकाले साङ्गना व्यङ्गना वा
 करकरिकसमेतानर्धपैष्टिच्युरोगान् ।
 असितसित समुत्थान सन्निवर्त्तमानान्
 हरति नयनरोगान् सेव्यमाना शलाका ।

Oakradatta, Netraroga Cikitsā.

² "Vide Prinsep's (Thomas) Indian Antiquities, fig. 18. pl. iv" J.A.S.B. IX. 1. 7.

Specillum with two olivary ends formed a variety of probe of the Greek and Roman surgeons. It was used as an ordinary probe in dealing with crooked fistulæ, and as a cautery to destroy the roots of hairs after epilation. Sometimes it carried an eye in one of its olives and was used in the treatment of nasal polypus. The eye was threaded with a cord having many knots along it. The other end of the probe was pushed through the nose and withdrawn by the mouth, and then by a sawing movement of the cord with both hands of the surgeon, the polypus was removed.¹ A single probe for the application of semi-solid medicaments, occurs in the outfit of the oculist of Rheims, in the museum at St. Germain-en-Laye and is figured by Milne.²

KARNA-ŚODHANA OR EAR-CLEANER.

This śalākā is said to have its end shaped like the end of a leaf of Aśvattha (*Ficus religiosa*). The instrument looked like a sruva—one of the famous spoons used in sacrificial ceremony.³ It was used for the purpose of extracting wax from the ears.

The different kinds of spoons used in the ancient Hindu ceremonies were as follows: "Three different sruk or offering-spoons are used *viz.*, the guhu, upabhrīt and drubha. They are made each of a different kind of wood, of an arm's length (or according to others, a cubit long) with a bowl of the shape and size of the hand, and a hole cut through the bark and front

¹ Paul VI. lxxxvii, VI. xiv, VI. xxv.

² Græco-Roman Surgical Instruments, pl. xi. fig. 5.

³ कर्णशोधन मन्त्र पद प्रालं सुवाननं ॥

side of the bowl and fitted with a spout, some eight or nine inches long and shaped like a goose's bill. The *sruva* or dipping-spoon, on the other hand, chiefly used for ladling the clarified butter (or milk) from the butter vessel into the offering-spoons, is of the "khadira wood (*Accacia catechu*), a cubit long, with a round bowl measuring a thumb's joint across and without a spout".¹

So we see that the bowl of the *karna-sôdhana* was round in shape.

Suśruta also mentions a *śalākā* for the extraction of cerumen or minute insects from the ears.² Cakrapāṇi³ alludes to it. In modern times, the ear-cleaner, as used commonly in India, is a *tāla yantra*. Ear specillum is frequently mentioned by the Greeks and Romans. It consisted of a small narrow scoop at one end and a simple probe at the other. The use of the scoop is thus described by Archigenes⁴: "If a bean, stone, etc. fall into the ear, remove it with the small narrow scoop of the ear specillum". Celsus⁵ directs us to extract a scab or cerumen by means of the ear specillum.

The ear scoop used by the modern surgeons is a narrow scoop, more like the Hindu *pujā* vessel known as *kuśi*. The ear scoop is often made in combination with a director.

¹ Śatapatha Brāhmaṇa, Sacred Books of the East. 1. 3. 1. 1. foot-note.

² See foot note 1, P. 149

³ क्लेदयित्वा तु तैलेन स्वेदेन प्रविश्याय च ।

शोधयेत् कर्णगूयस्तु भिषक् सम्यक् शलाकया ॥

Cakradatta, Karna-roga.

⁴ Galen. XII, 652.

⁵ Celsus. VI. viii.

GARBHA-ŚAṆKU. FŒTUS OR TRACTION HOOK.

The end of this instrument is said to have been bent like añkuṣa or elephant driver's goad. It is described to have the same length as the other śaṅku have *i. e.* ten to sixteen añguli, and it is eight añguli in width.¹ It is recommended for extracting a dead fœtus from the mother's womb, after perforating its head by the maṇḍalāgra or mudrikā knife. Suśruta recommends us to perforate the head and then to extract the bones by the śaṅku or hook, and lastly to apply traction by fixing it about the chest or axilla. If the head can not be perforated, it is to be applied to the eyes or cheeks.²

Traction hook for extraction of a dead fœtus was well known to the ancients. Hippocrates³ bids us break up the head of the fœtus with a cephalotribe and remove the bones with bone forceps, or deliver it by a traction hook inserted near the clavicle. Celsus⁴ advises us to insert a smooth hook with a short point and to fix it in the eye, or the ear, or the mouth, or the forehead, and so the fœtus is to be dragged down. Soranus points out the best places for the insertion of the hook to be the eyes, the occiput, the mouth, the clavicles, and the

¹ नतोऽग्रे शङ्कुना तुल्यो गर्भं शङ्कुरितिव्यूतः ।

अष्टाङ्गुला यतस्तेन मूढगर्भं हरेत् स्त्रियाः ॥ १६ ।

Aṣṭāṅga Hṛdaya Saṁhitā I. xxv.

² तत्र स्त्रियमाश्रय मण्डलाग्रिणाङ्गुलीशस्त्रेण वा शिरोविदाय्य शिरःकपालान्धातव्य शङ्कुना गृहीत्वोत्तरसि कचायां वापहरेदभिन्ने शिरसि चाचिकूटे गन्धे वा ।

Suśruta Saṁhitā. IV. xv.

³ Hippocrates. II. 70.

⁴ Celsus. VII. xxix.

ribs in head presentations; and the pubes, ribs, and clavicles in footling cases.¹ Soranus, Aetius² and Paul³ direct us to extract the foetus in the same way but they recommend us to use two hooks instead of one, in order that the pulling may be straight down and not to one side.

Albucasis,⁴ Rhases,⁵ Haly Abbas,⁶ and Avicenna⁷ give similar directions for opening the child's head and for delivering the foetus with hooks.

This purpose in modern times is served by the blunt hook and crotchet.

YUJÑA-SĀṆKU OF MIDWIFERY FORCEPS.

An instrument is thus named and figured by modern writers on Hindu surgery, bearing some resemblance to the modern forceps, for extracting the child alive. We have, however, no mention of any such instrument in the works of Caraka, Suśruta Vāgbhaṭa and other ancient authorities. The Greeks and, Romans were also ignorant of it; and the Arabians fared no better, though Adams, in his commentary on Paul⁸ asserts that Avicenna refers to forceps for the delivery of living children. Mulder, in his valuable work,⁹ gives an extract from a translation from the works of Avicenna supporting

¹ Soranus. II. xix.

² Aetius. IV. iv. 23.

³ Paul. VI. lxxix.

⁴ Albucasis. Chirrug. II. 76 and 77.

⁵ Rhases. Cont. xxii.

⁶ Haly Abbas. Pract. ix. 57.

⁷ Avicenna. iii. 21, i, 24.

⁸ Paulus. Æginita. III. lxxvi.

⁹ Historia Forcipum et Vecticum. p. 6.

the same conclusion. Smellie¹ says : "With regard to the fillets and forceps, they have been alleged to be late inventions ; yet we find Avicenna recommending the use of both. The forceps recommended by Avicenna is plainly intended to save the foetus". "He recommends all the old methods for assisting in natural labours ; and if the woman can not be delivered by these, he orders a fillet to be fixed over the head : if that can not be done, to extract with the *forceps* ; and should these fail, to open the skull ; by which means the contents will be evacuated, the head diminished, and the foetus easily delivered."² Playfair³ also holds the same view. The point is however by no means settled. For Milne⁴ says : "A full consideration of Avicenna's words seems to me to lead to the conclusion that he is describing no more than extraction with a craniotomy forceps. If the forceps fail, the child is to be extracted by incision, as in the case of a foetus already dead (and decomposed so that the forceps would not hold)."

Thus we may be sure that there is no available evidence of the use of delivery forceps by the Hindus, Greeks, Romans and Arabs ; and the Chamberlens are still the undisputed claimants to the glory of the invention.

But there is no doubt that the Hindu surgeons tried extraction of the living foetus by manual traction. The hands are recommended to be well oiled and introduced into the uterus. If the child be dead, sharp instruments are advised to be intro-

¹ Smellie. Treatise on Midwifery, p. 40.

² Ibid. Edited by McClintock. New Syd. Soc. vol. I. Introduction p. 50.

³ Researches on Operative Midwifery, p. 10.

⁴ Græco-Roman Surgical Instruments, p. 156.

duced into the vagina for cutting upon the foetus. But on no account such instruments are to be used so long as the child is alive.¹

SARPA-FANĀ OR SNAKE'S HOOD.

It is also called *agra-bakra* i. e. the end bent. It is a *śaṅku* or hook similar to the above, the end being bent like the hood of a snake.² It is to be used for the purpose of extracting stone after operation.

Suśruta, in the operation for extraction of stone through the perineal incision, directs us to use the *agra-bakra* to bring the entire stone out of the wound. But in the case of females, he recommends us to use a knife having a spoon like a scoop, to prevent the formation of a vesico-vaginal fistula.³ Is it a spoon-shaped knife, or is it a double instrument on a handle—a knife at one end and a scoop at the other? The Greeks used a knife having a scoop at the end.

¹ गर्भे जीवति मूर्द्धं तु गर्भं यन्ने न निर्हरेत् ।

हस्तेन सर्पिषाक्तेन योनेरन्तर्गतेन सा ॥

मृते तु गर्भे गर्भिण्या योनीं शस्त्रं प्रवेशयेत् ।

शस्त्रशास्त्रार्थविदूषी लघुहस्ता भयोजिह्वता ।

सचेतनं तु शस्त्रे न न कथञ्चन दारयेत् ॥

Yogaratanākara, Mūddhagarva Cikitsā.

² अशम्यार्हहरणं सर्पफणावद्वक्तं चयतः ॥

Aṣṭāṅga Hṛdaya Saṁhitā. I. xxv.

³ यथा च न भिद्यते न चूर्ण्यते वा तथा प्रयतेत चूर्णमल्पमप्यवस्थितं हि पुनः परिवृद्धिमेति तस्मात् समक्षामयवक्त्रेणाददौत । स्त्रीणामु वक्षिपार्श्वगतो गर्भाग्रयः सन्निवृत्तः तस्मान्न सासुत्सङ्गवच्छस्त्रं पातयेदतोऽप्यथा खल्वासां मूत्रसावौ व्रणौ भवेत् ।

Suśruta, Saṁhitā. IV. vii.

Celsus¹ describes the extraction of stone through a perineal section by means of the lithotomy scoop. "The scoop is slender at the end and flattened out in the shape of a semi-circle, smooth externally where it comes in contact with the tissue, rough internally where it meets the calculus". It was a long hook-like instrument.

Aetius² mentions a special stone extractor, under the treatment of calculus in the female. Some understand by it the lithotomy forceps.

In modern times we use the lithotomy forceps and scoop for the same purpose.

I take this opportunity of referring to the celebrated passage in the famous Hippocratic oath, which runs as follows: "I will not cut persons labouring under the stone, but will have this to be done by men who are practitioners of this art". This sentence has given a good deal of trouble to the commentators and they have failed to understand the true reasons as to why Hippocrates specially forbade the practice of this operation. "M. Littré finds some difficulty in accounting for the circumstance that the novice in surgery is interdicted from the operation of lithotomy." Adams,³ commenting on the sentence, says: "Why this operation was proscribed, can not indeed be satisfactorily ascertained," and he quotes the Arab Physician, Avenzoar⁴, who "pronounces the operation to be one, which no respectable physician would witness, and far less to perform."

¹ Celsus. vii. xxvii.

² Aetius, IV. iv. 94.

³ The Genuine Works of Hippocrates. Vol. II. P. 777—8.

⁴ Avenzoar. II. 2, 7.

The explanation that this was proscribed because there were men who devoted themselves exclusively to this kind of treatment, and that if the qualified surgeons be allowed to practise the operation, they would interfere in the sphere of action of the lay lithotomists, cannot be considered satisfactory. For the question still remains the open one, why should Hippocrates proscribe this operation from the domains of scientific surgery, simply because a few laymen happened to practise it.

The real explanation is that in Hippocrates' time success in the operation was very difficult to achieve, consequently he interdicted the operation much in the same way as abdominal operations were considered sacred before the days of antiseptic surgery. It is curious to find that Suśruta calls this operation the worst of all surgical operations, for he says¹: "Even experienced and able surgeons fail to attain success by operation for the stone. So the surgical treatment is the worst of all treatment here. But if you do not operate, the patient will die; and it is doubtful whether he will live after the operation; so give him the chance of operation in God's name." I do not know whether this passage of Suśruta has any causal relation to the remarks of Hippocrates, but there is no doubt that the former serves as a better commentary on the latter, than anything hitherto suggested.

Adams² says that this operation was practised by a class of men,

¹ कुशलास्यापि वैद्यस्य यतः सिद्धिरिहाम्नु वा ।

उपक्रमो जघन्योऽयमतः स परिकीर्तितः ॥

अक्रियायां भ्रुवो मृत्युः क्रियायां संशयो भवेत् ।

तस्मादापृच्छ्य कर्तव्यमीश्वरं साधूकारिण ॥

Suśruta Samhitā. IV. vii.

² Commentary on Paulus Ægineta. Vol. II, P. 363.

separate from the surgeons, in all countries in ancient times, and points out that the ancient operation of lithotomy is still practised with great success by the native doctors of Hindusthan. No conclusion is, however, to be drawn from the modern practices in India, as we find separate classes of men not only for stone, but also for bone-setting, cataract, etc. And whatever may be the practice in modern times, we find that during Suśruta's time, the operation was not the privilege of the laymen.

ŚARAPUṆKHA-MUKHA PROBE.

This instrument is also described to have its end bent like the hood of a snake. It is four aṅguli long and is recommended to be used for the purpose of extracting a tooth from its socket.¹

Tooth elevator or instrument for levering teeth is mentioned by Galen.² It is of the same size as the bone lever which, according to Paul,³ is seven or eight aṅguli long.

This instrument resembles in shape and action the tooth elevator of the modern surgeons.

ARDHACANDRA-MUKHA ŚĀLĀ. HALF-MOON PROBE.

The first half of this variety of śālā is curved like a half-moon, to which is attached the second half as a rounded handle.⁴ Suśruta advises us to use it for the purpose of applying actual

¹ शरपुङ्खमुखं दन्तपातनं चतुरङ्गुलम् ॥

Aṣṭāṅga Hṛdaya Saṁhitā. I. xxv.

² Galen. xviii. 593.

³ Paulus Ægineta. VI. cvi.

⁴ शलाकामन्त्रबन्धनि ।

मध्योर्ध्वं वृत्तदण्डाच्च मूले चाङ्गुलसन्निभा ॥

Aṣṭāṅga Hṛdaya Saṁhitā I. xxv.

cautery to the groin in bubonecele, to prevent the hernia from entering into the scrotum.¹

A crescent-shaped cautery was also used by the Greek and Roman surgeons. So Paul² says that in cases of sloughing of the prepuce we must cut it off and use lunated cauteries to stop hæmorrhage and prevent the spreading of the wound. Again he mentions a cautery shaped like the Greek letter Γ, in the radical cure of hernia.³

BONE LEVER.

Instruments for levering fractured bones into their proper positions are mentioned several times by Suśruta. In the treatment of fracture of the nasal bones, a śalākā is recommended to be used as a bone lever for raising and depressing the fractured ends.⁴ Sometime a muṣala or pestle is advised to be used.⁵ It is a thick wooden pestle the end of which is plaited with iron. It is still used to strike upon paddy to separate the husk from the rice. Suśruta mentions its use to reduce dislocations of the joints of the shoulder and neck.⁶

¹ तत्र या वङ्गणस्था ताः दहेदङ्गुलवक्रया ।

² सम्यग्मार्गावरोधार्थं कोशप्राप्तां तु वर्जयेत् ॥

Suśruta Samhitā, IV. xix.

³ Paulus Aegineta. VI. lvii.

⁴ Ibid. VI. lxii.

⁵ नासां सन्नां विवृतां वा ऋज्वीं कृत्वा शलाकया ।

Suśruta Samhitā, IV. iii.

⁶ सन्नसुन्नमयेत् खिन्नमचकम् मूषलेण तु ।

तथोन्नतं पीडयेच्च वक्षीयाद्वादमेव च ॥

Ibid.

⁷ तैलपूष कटाक्षे वा द्रोण्यां वा शययेन्नरं ॥

मूषलेनोत्क्षिपेत् कालमांससन्धौ विसंहते ।

स्थानास्थितश्च वक्षीत स्वस्तिकेन विचक्षणः ॥

Ibid.

The pestle was also used by Hippocrates¹ to reduce dislocation of the shoulder joint. He says : "Those who accomplish the reduction forcibly bending it round a pestle, operate in a manner which is natural. But the pestle should be wrapped in a soft shawl (for thus it will be less slippery), and it should be forced between the ribs and the head of the humerus. And if the pestle be short, the patient should be seated upon something, so that his arm can with difficulty pass above the pestle. But for the most part the pestle should be longer, so that the patient when standing may be almost suspended upon the piece of wood. And then the arm and forearm should be stretched along the pestle, whilst some person secures the opposite side of the body by throwing his arms round the neck, near the clavicle"

The bone lever used by the Greeks is thus described by Paul :² "It is an instrument of steel about seven or eight fingers' breadth in length, of moderate thickness that it may not bend during the operation, with its extremity sharp, broad and somewhat curved."

DIRECTOR.

Suśruta³ mentions the use of eṣaṇī or metallic probes not only to ascertain the course of the fistulous track but also to raise the bridge of skin covering the sinuses, so that the surgeon may operate on it as a guide. Cakradatta⁴ also uses a probe to

¹ The Genuine Works of Hippocrates. Adams' Trans. p. 372.

² Paulus Ægineta, Vi. cvi.

³ पक्षेषु चोपनिग्धमवगाहस्त्रिंशं शय्यायां सन्निविष्टार्थसमिव यन्मयित्वा भगन्दरं समीच्या पराचीनमवाचीनं वा वह्निर्मुखमन्तर्मुखं वा ततः प्रणिधायैषणौमुन्नम्य साश्रयमुत्तरेच्छस्त्रेण
Suśruta Samhitā, IV. viii.

⁴ नाडीनां गतिमन्विष्य शस्त्रेनापाद्य कर्मवित्।

Cakradatta, Nāḍivraṇa Cikitsā.

learn the direction of the wound before operation. It is also mentioned in the *Yogarātnākara*.¹

In the treatment of fistulæ, Celsus² also says: "A director being inserted into them down to their termination, the skin ought to be incised." It is not mentioned that the *eṣaṇī* or probe was grooved, but there is no doubt of its use like a grooved director, so common nowadays. The discovery of such a director, along with several other surgical instruments, which are preserved in the *Musée de Cinquantenaire*, Brussels, proves that it was known to the Romans.

URETHRAL PROBE.

A variety of *śālākā* is described by *Suśruta*³ to have its end rounded like the stalk of a *mālatī* flower (*Echites caryophyllata*, Rox.) It is to be used for cleaning the urethral canal.

*Caraka*⁴ mentions a probe for examining the direction of the urethral canal and its pathological condition, before introducing the tube of the urethral or bladder clysters into it.

¹ नाडीनां गतिमन्वील्य शस्त्रे शीतपाद्य कर्षयित् ।

Yogarātnākara, p. 346.

² Celsus, VII. iv.

Græco-Roman Surgical Instruments, p. 73.

³ मृदमार्गविशौघनार्थं एकं शालनीपुष्पहन्तायप्रमाण परिमण्डलमिति ।

Suśruta Samhitā, I. vii.

⁴ ऋजोः सुखोपविष्टस्य हृष्टे मेद्रे घृतान्विते ।

शलाकयान्विष्य गतिं यद्यप्रतिहता व्रजेत् ॥

ततः श्लेष्मप्रमाणेन पुष्पनेत्रं प्रवेशयेत् ॥

Caraka Samhitā, VIII. ix.

Class VI. The Upayantra or Accessory Instruments.

The sixth class of the blunt instruments comprises the upayantra or accessory instruments. By surgical instruments, the Hindus consider not only the instruments proper, but also any mechanical aid by which the object of the surgical treatment is attained. Thus even medicinal agents are considered under this head for they help the inflammatory swellings to subside, or suppurate, or burst open as by various external applications. The accessory instruments are :

1. RAJJU OR THREAD.

As an example of thread being used as an instrument of surgery, we know that the thread smeared with caustics are recommended by Suśruta¹—kṣāra sūtra or caustic thread—for the operation of fistula-in-ano. For further informations on the subject see “Eṣanī or sharp probes” under the Śastra.

Thread as a material of phalavartī or tent is mentioned by Śārṅgadhara.² If after a vaginal or intra-uterine doughe, the injection does not flow out, he advises us to introduce a strong tent made of thread, dipped in oleaginous medicines of the

¹ कृशदुर्बलभौरुणां नाडीमर्शप्रिताच या ।

चारसूत्रेण क्षिप्यान्नतु शस्त्रेण बुद्धिमान् ॥

Suśruta Samhitā, IV, xvii.

Cakradatta, Nāḍīvr̥ṇa Cikitsā.

² फलवर्तिं निदध्याद्वा योनिमार्गे दृढं भिषक् ।

सूत्रैर्विनर्मितां सिग्धां शोधनद्रव्यसंयुताम् ॥

Śārṅgadhara Saṅgraha, III, vii

śodhana (Purifier) group. Cakradatta¹ uses caustic threads in the treatment of piles by ligature.

2. VENIKĀ OR TWINE.

The use of twine as a ligature to be applied above the part bitten by a snake to arrest the circulation of blood towards the heart is mentioned by Suśruta.² Caraka³ also advises us to tie ligatures above and below the bitten part, then to squeeze out the poison towards the wound, whence it is to be drawn out through incisions made by a knife.

3. PAṬṬA OR BANDAGES.

For the proper application of bandages, Suśruta mentions the following materials to be necessary :⁴ viz., cloth manufactured

¹ भावितं रज्ज्वनीचूर्णेः स्त्रुहीचौरि पुनःपुनः ।

वन्धनात् सुदृढं सत् भिनत्ताशो भगन्दरं ॥

Cakradatta, Arśarōga Cikitsā.

² सा तु रज्जादिभिर्वद्धा विषप्रतिकरीमता ।

Suśruta Saṁhitā, V. v.

³ दंशात् तु विषं दष्टस्य विसृतं वेणिकां भिषक् वद्धा ।

निष्पीडयेद्दंशं दंशमुच्चरेन्मर्म्भं वर्ज्जम् ॥

Caraka Saṁhitā, VI. xxv.

⁴ अत ऊर्ध्वं त्रणवन्धनं द्रव्याण्युपदेक्षामः । तद्यथा चौमकार्पासविकटुकूल कौशेय पत्रोर्ण चीनपद्मचर्मालव्यल्कलालावूश्कललता विदलरज्जुतूलफलसन्तानिका लौहानीति तेषां व्याधि कालं चावेद्योपयोगः प्रकरणतश्चैवामादेशः । तत्र कौशदामस्तस्तिक्तानूवेक्षितप्रतोली- मण्डलस्थगिकायमकखट्वाचीनविवन्धवितानगोफणाः पञ्चाङ्गी चेति चतुर्दशवन्धविशेषाः ।

तेषां नामभिरेवाङ्गतयः प्रायेणव्याख्याताः । तत्रकौशमङ्गुष्ठाङ्गुलिपर्वसु विदध्यात् । दाम सम्भाषेऽङ्गे । सम्बिकृद्वंकभूस्तान्तरतलकार्णेषु स्तसिकां । अनुवेक्षितानु शास्त्रासु, । शौबामिद्रयोः प्रतोली । वृत्तेऽङ्गे मण्डलं । अङ्गुष्ठाङ्गुलिमिद्रयेषु स्थगिकां । यमलत्रणयो र्यमकं । इगुशङ्कगण्डेषु खट्वां । अपाङ्गयोचीनं । पृष्ठदरोरःसु विवन्धं । मूर्ध्नि वितानां चिबुकनासीषां सवस्तिषु गोफणां । जगुणऊर्ध्वं पञ्चाङ्गीमिति । यो वा यस्मिन् शरीरं प्रदेशे सुविचिष्टो भवति तं तस्मिन् विदध्यात् ।

Suśruta Saṁhitā, I. xviii.

from the fibres of plants, flax, cotton, wool, blankets, silk, leather, Chinese cloth, inner barks of trees, bark of bottle gourd (*Cucurbita lagenaria*), tendrils of twining plants, cane or pieces of split bamboo, rope, fruits as those of *Bombax Malabaricum*, blades of knives, and plates of metals as gold, or lead, or iron. These articles should be used with due consideration as regards the nature of the disease, the time of their use and the purpose in hand. He describes fourteen varieties of bandages as follows:—

1. *Kośa* :— a hollow cylinder or sheath to be applied to the joints of the thumb and fingers. This form of bandage is to be applied over the stumps after amputation of the limbs.

2. *Dāma* (*i.e.* tail of a quadruped?) :— it is a large bandage to be tied round a part for the relief of pain or cramps.

3. *Svastica* or a circular cross-bandage:— it is to be applied round the joints, the space between the tendons of the great and second toes, the intermammary region, the glabella (space between the eyebrows), the plantar surfaces of the feet, the palmer surfaces of the hands, and the ears. It is also the form of bandage recommended in dislocations of the shoulder joint.

4. *Anuvellita* or an encircling bandage :—it is to be applied to the limbs. This form of bandage is recommended to be applied to the limbs in cases of oblique, deep, and large cuts inflicted by a knife. A leather bandage applied in the form of *gophaṇā* would also serve the purpose. The encircling bandage is also advised in cases of fracture of the ribs.

5. *Protolī* :— a broad bandage for the neck and penis.

6. *Maṇḍala* or a circular bandage :— it is to be applied to

the round parts of the body such as the arms, sides, abdomen, thighs, and back.

7. *Sthagikā* or a supporter:— a bandage enclosing a splint and pastes of medicaments to keep the parts firm. It is to be applied over the ends of the thumb, fingers, and penis. *Suśruta* directs us to use this bandage round the scrotum after tapping the hydrocele.

8. *Yamaka* or a double-bandage:— a pair of circular bandages applied to a couple of ulcers on a part.

9. *Khatvā* or a four-tailed bandage:— it is recommended for the temples, cheeks and lower jaw.

10. *China* or a banner bandage:— a bandage for the inner angles of the eyes.

11. *Vivandhana* or a circular chest-bandage:— it is the bandage for the back, abdomen and chest.

12. *Vitāna* or a canopy bandage:— a large bandage for the head.

13. *Gophaṇā*¹ (*lit.* a sling for throwing stones):— a concave bandage for the chin, nose, lips, shoulders and pelvis.

¹ शास्त्रासु प्रतितां स्थिर्यक् प्रहाराविवृतान् भृशं ।

सीव्येत् सम्यग्निवेश्याद्यु सन्ध्यस्थीन्यनुपूर्वशः ॥

वद्धा वेक्षितकौनाद्यु ततस्तैलेन सेचयेत् ।

चर्च्यना गोफणावन्धः कार्यो यो वा द्विती भवेत् ॥

Suśruta Saṁhitā, IV. ii.

पादौ निरस्तमुष्णस्य जलेन प्रोक्ष्य चाक्षिणी ।

प्रवेश्य तुद्वसेवन्या मुष्णौ सीवेत्ततः परं ॥

कार्यो गोफणिकावन्धः कक्ष्यामावेश्य यन्त्रकं ॥

14. *Pañcāṅgī* or a five-tailed bandage¹:— it is intended for the parts above the clavicle, as in the dislocations of the lower jaw. *Caraka*² mentions a bandage called *kavalikā*, to be tied tightly after setting a fracture or reducing a dislocation. It is so-called from the medicinal paste which is applied to the affected parts, underneath the splints.

Dunghlison mentions a bandage called *Accipitar* to be applied over the nose. It is so called from its likeness to the claws of a hawk. It resembles the *pañcāṅgī* bandage of the Hindus.

So the bandages are recommended to vary according to the different parts of the body; and the surgeon, using his discretion, is to select the form of bandage suitable to the part. The bandages are recommended to be firmly secured to their place by three strings, applied upwards, downwards and obliquely. The knot is avoided over the seat of ulcer and tied on a side.

Suśruta says: “Bandages are applied with three degrees of tightness according to the seat of the abscess:—
1. A tight bandage causes uneasiness but not actual pain;
2. A loose bandage is loose and relaxed; 3. An even bandage is properly applied—neither tight nor loose. The tight bandage is to be applied to the buttocks, sides of the abdomen, axilla, groin, chest and head. The eyes and joints

¹ हन्वस्थिनी समानीय हनुसन्धौ विसंहते ।

खेदयित्वा स्थिते सम्यक् पञ्चाङ्गीं वितरेद्विषक् ॥

Suśruta Samhitā, IV. iii.

² अस्थिमग्नं च्युतं सन्धिं संदधौत समं पूनः ।

समेन सममङ्गेन कृत्वा न्येन विचक्षणः ॥

स्थिरैः कवलिकावन्धैः कुशिकाभिश्च संस्थितम् ।

पटैः प्रभूत सर्पिण्यैर्वध्नीयादवलं सुखं ॥

Caraka Samhitā, VI. xiii.

are loosely bandaged. The even bandage is for the extremities, face, ears, neck, penis, scrotum, back, sides, and abdomen.”¹

Suśruta next deals with the alterations in the mode of applying bandages according to the rules laid down. He also advises the surgeon to be guided by the dictates of his common sense. He directs us to practise bandaging on the various large and small limbs of a human figure made of cloth or clay.²

With regard to the mode of application of bandages, Hippocrates says:³ “It should be done quickly, without pain, with ease and with elegance, it should fit well and neatly. The forms of it are the simple, the slightly winding (called *ascia*), the sloping (*sima*), the monocus, the rhombus, and semi-rhombus”.

The whole chapter of Suśruta is very interesting and will repay perusal. If bodily transferred, it will adorn any modern text book on surgery.

As it is very difficult to convey a correct idea of these bandages in words, I have given figures of them from modern works on surgery, from which their construction and uses will be readily understood at a glance.

¹ तत्र व्रणायतनविशेषाद्वन्ध विशेषस्त्रिविधो भवति गाढः समः शिथिल इति ।

पीडयन्नरुजो गाढः सोच्छ्वासः शिथिलः स्मृतः ।

नैव गाढो न शिथिलः समोवन्धः प्रकीर्तितः ।

तत्र स्निग्धं कुचि कचावङ्गणोरः शिरः सुगाढः । शाखावदनं कर्णकण्ठमेन्द्रमुष्कावृष्टपाशो-
दास्तु समः । अस्थीः सन्धिषु च शिथिल इति ।

Suśruta Samhitā, I. xviii.

² पुस्तकमथ पुरुषाङ्गं प्रत्यङ्गविशेषेषु बन्धयोग्यं ।

Ibid, I. ix.

³ The Genuine Works of Hippocrates, Vol. II, P. 477. Syd. Soc. Ed.

ABDOMINAL BINDER.

Caraka¹ mentions the use of abdominal binder for the recently delivered woman to prevent derangement of air by its expansion in her abdomen.

Dr. Barnes says:² "The sudden expulsion of one-tenth of the body-weight from the abdominal cavity is attended by a sudden removal of a force hitherto pressing upon the vessels and organs of the chest, abdomen, and pelvis. This entails in some cases a tendency to vacuum. Hence disturbance of the circulation. Now the binder, by supporting the abdominal walls, restores the equilibrium of pressure. The pressure exerted upon the uterus works as a gentle continuous stimulus to contraction. The woman is conscious of the support and is grateful for it. . . . The figure, so precious, and rightly so, to women, is better preserved So applied, the binder becomes one of the most efficient agents in antiseptic midwifery; it keeps the walls of the uterus and vagina in contact, thus preventing the collection of fluids or clots, and shutting out air".

The use of cloth for other surgical purposes is also mentioned:—

FIELD HOSPITAL.

The cloth is to be used for the manufacture of tents for the doctors to live in. The wounded in war are to be treated in such tents. The tent of the surgeon-general should be close to that of the king in the battle-field.³

¹ वेष्टयेदुदरं मङ्गता वाससा तथा तस्या न वायुवदरे विज्ञातिमुत्पादयत्यनवकाशत्वात् ।

Caraka Samhitā, IV. viii.

² Obstetric Medicine and Surgery, Vol. II, p. 87.

³ सन्ध्यावारे च मङ्गति राजयेद्वादनन्तरं ।

भवेत् सन्निहितो वैद्यः सर्वोपकरणान्वितः ॥

Small tents are also recommended for applying vapour bath to patients.

DRESSINGS.

Dr̥ghavala¹ mentions the use of medicated gauzes to be used as sponge by the females and says : "In discharges from the vagina, pieces of cloth soaked in decoction of barks of Vata (*Ficus Bengalensis*) and Lodha (*Symplocos racemosa*) and dried, should be put inside the canal."

In the Mohāvāgga² we find the use of itch-cloth :—
"I allow, O Bhikkhus, to whomsoever has the itch, or boils, or a discharge, or scabs, the use of an itch-cloth".

"According to the 90th Pakittiya such cloth must not be more than four spans in length and two in breadth."

I can not help quoting from Mohāvāgga,³ another discourse of Buddha as it shows clearly the surgical treatment of boils in ancient times :—

Now at that time a certain Bhikkhu had boils.

"I allow, O Bhikkhus, the use of the lancet".

Decoctions of astringent herbs were required.

"I allow, O Bhikkhus, decoctions of astringent herbs".

Sesamum salve was required.

तत्रस्थमेनं भजवदशः ख्यातिं समुच्छ्रितं ।

उपसर्पन्त्यमीहेन विषशल्यामयद्भिः ताः ॥

Suśruta Samhitā, I. xxxiv.

¹ न्ययोधत्वक् कषायेण लोभ्रकल्कं तथा पिबेत् ।

आस्त्रावे चीमपट्टं वा भावितं तेऽनुधारयेत् ॥

Caraka Samhitā, VI. xxx.

² Mahāvāgga. VIII. 17, 2.

³ Ibid. VI. 14, 4 & 5.

"I allow, O Bhikkhus, the use of sesamum salve".

5. Compresses were required.

"I allow, O Bhikkhus, the use of compresses."

It was necessary to tie up the sore with cloth.

"I allow, O Bhikkhus, the use of bandages for tying up wounds".

The sore itched.

"I allow you, O Bhikkhus, the sprinkling of a sore with mustard-powder".

The sore became moist.

"I allow you, Bhikkhus, to fumigate (the sore)."

Proud flesh formed on the wound.

"I allow you, O Bhikkhus, to cut off (proud flesh) with a lancet".

The wound would not close up.

"I allow, O Bhikkhus, the use of oil for wounds".

The oil ran over.

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of fine rags, and of all kinds of ways of treating wounds".

If the object of fumigating the sore was to sterilize it, as it certainly was, we may take this dialogue as the best sketch of the scientific treatment of boils,— remembering that it represents the knowledge of surgery more than 2500 years ago.

Cakrapāṇi advises us to tie the ends of the hairs of a patient, by a piece of cloth,¹ before performing phlebotomy on the vessels of the head and neck.

¹ चक्षुष्यद्वारा केशान्ती जालुस्थापितकर्परः ।

4. CARMA OR LEATHER.

The use of leather in ancient medical practice in India was manifold.

Leather bandage.

Straps or belts of leather were used as bandages. Suśruta¹ advises us to apply the leather bandage in cases where more than half the thickness of the upper or lower extremities are cut by some sharp instruments in a slanting direction. Then the parts of the wound should be well adjusted, the bone and the soft parts kept in apposition, and the wound closed by sutures and well covered by dressings, over which the leather bandage is to be applied in the form of a gophaṇā or sling.

Leather bandage in the form of gophaṇā is mentioned by Suśruta² to be applied over the anus to prevent recurrence of pro-
 cidentia of the rectum. The prolapsed bowl should be well bathed with ghee and fomented; and then reduced by gentle pressure. There should be a hole in the bandage just in front of the anus to allow flatus to pass out. Vṛnda³ alludes to it. Similarly the modern surgeons use a pad supported by a bandage as an aid in

¹ See foot-note 1, P. 178.

² गुदधंशे गुदं खिन्नं स्नेहाभ्यक्तं प्रवेशयेत् ।

कारयेद्गोर्माणावन्धं सक्किद्रेण चर्मणा ॥

Suśruta Samhitā, IV. xx.

³ गुदधंशे गुदं स्नेहैरभ्यज्याऽथ प्रवेशयेत् ।

प्रविष्टं स्नेहयेत्तपि वद्धं गोः फणया भ्रशम् ॥

गोः फणयेति । गोः फणा वन्धविशेषः ।

उक्तं हि—उच्चारनिर्गमाय सक्किद्रेण चर्मणा चास्य गोः फणावन्धः कार्य इति ॥

Vṛndamādhava or Sidhhayoga, Ch. 57.

preventing descent of the gut. It is mentioned also in the Cakradatta¹ and the Yogaratnākara.²

Dr̥ghavala mentions the use of a piece of untanned leather to be applied over a layer of ointment during the day, while during the night the leaf of Eranda (*Ricinus communis*) is directed to be used.³

LEATHER LIGATURES.

In the treatment of snake-bite, a ligature is advised to be used above the seat of injury to stop the circulation of poisoned blood. This ligature is advised to be made of leather, or braided fibres of trees, or soft cord of jute, etc.⁴

YANTRA-ŚĀṬAKA. LITHOTOMY STRAP OR BINDING APPARATUS.

This is the name of the leather shackle, which is recommended to be used during the operation for stone in the bladder. The patient should flex his knees and elbows; and the parts are to be

¹ गुदबंधे गुदं स्नेहैरभ्यज्याऽऽद्य प्रवेष्टयेत् ।

प्रविष्टे स्वेदयेद्यापि बद्धं गोः फणया हृदम् ॥

Cakradatta, Kṣudraroga Cikitsā.

² गुदबंधे गुदं स्निग्धं जेहेनाह्नं प्रवेष्टयेत् ।

प्रविष्टं रोधयेद्यवाद्रम्यसंक्षिद्रं चर्चयेत् ॥

Yogaratanākara, P. 343.

³ परस्परपदेः प्रक्षाल्य रात्री कर्तव्यं विनोचयेत् ॥

बीराम्बुजा ततः सिद्धं पुनश्चोपनाहितम् ।

सुखेद्रादी दिवावद्धं चर्चयित्वा सुलोमनिः ॥ ८४ ।

Caraka Saṁhitā, VI. xxviii.

⁴ सर्वदेवादितः सर्पः शास्त्रादप्यस्य देहिनिः ।

देवस्योपरि बह्वीयादरिष्टावतुष्टाङ्गुली ॥

श्रोतवर्धमान-वस्त्राणां बद्ध्वा तमेन च ।

न चक्षति विषं देहमरिष्टाभिर्निवारितं ॥

Saṁhitā, V. v

tied together by this instrument.¹ Similarly, it is to be used during the operation for piles; but then, according to *Suśruta*,² the neck and thighs are to be tied by the instrument which is to be held firmly by the assistants. *Vāgrbhata*³ uses cloth instead of leather.

Yantra-śāṭaka is also to be used during the operation of phlebotomy. *Suśruta* says⁴: "If venesection is required to be done, the patient is to be seated on a stool, an aratni high (from the elbow to the end of the little finger), facing towards the sun. The thighs are to be flexed, the two elbows to be placed over the knees, and the hands (the fingers being clenched into fists) to be fixed on the two sides of the neck. The two ends of the shackle which pass over the fists, are held up at his back by the left hand of an assistant, who with his right hand steadily (neither forcibly nor loosely) presses above the part selected, to make the veins prominent, and at the same time rubs on the back to

¹ सङ्कुचितजानुकर्पूरमितरेण सद्वावह' सूत्रेण शाटकैर्वा ।

Suśruta Saṁhitā, IV. vii

² वस्त्रकम्बलकोपविष्ट' यन्त्रशाटकेन परिचितं शीवासकथं परिकर्मिभिः सुपरिग्रहीत-
मस्यन्दनशरीरं कृत्वा ।

Ibid. IV. vi.

अथ यन्त्रेण वाससा ।

सकथौ शिरोधरायाञ्च परिचितं सङ्कुचितम् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, IV. viii.

⁴ तत्र व्यध्यसिरं पुरुषं प्रत्यादित्यमुद्धमरजिमाचोक्षिते उपवेश्यासने सङ्कुचीराकुचितयो-
र्निवेश्य कूर्परसन्निवद्यस्थोपरि हस्तावन्तर्गुदाङ्गुष्ठकृतमुष्ठी मन्यदोः स्थापयित्वा यन्त्रशाटकं
शीवासुध्योरपरि परिबिध्यान्वेन पुरुषेण पश्चात्स्थितेन वानहकीनीसानेन शाटकान्तर्गुदाङ्गुष्ठकृत-
ततो वेद्यो ब्रूयाद्विषहस्तेन सितोऽयान्तायं नायावतयितुं यन्त्रमाविष्टयेत्पश्चात्कामावाहं
यन्त्रं पृष्ठमन्ये च पोडयेति कर्मपुनश्च वापुर्गुणं तुल्यं स्थानवेदेन उत्तमाङ्गगतानामन्यङ्गु-
वर्ज्यानां सिराणां व्यवेगं यन्त्रवधिः ।

Suśruta Saṁhitā, III. viii.

stimulate bleeding, the patient being then told to inflate his mouth with air forcibly. This is the method of binding for puncturing the veins of the head except those (veins) which have their mouths turned inside the body". Vāgbhaṭa describes a similar procedure in bleeding from the vessels of the neck¹.

The Greeks also used ligatures to tie up the arms and legs of a patient in the lithotomy position. Paul² says: "In operating, the woman should be placed on a seat in a supine posture, having her legs drawn up to the belly, and her thighs separated from one another. Let the arms likewise be brought down to her legs and secured by proper ligatures about the neck".

In modern times, similarly, we use lithotomy straps or crutch, after placing the patient in the lithotomy position during the operation of lithotomy and excision of piles.

PĀŚA-

This is a different shackle to be used for binding insane persons.³

¹ अग्रितापातपद्मिग्वो जानूञ्चासन संस्थितः ।

सदुपशतकीशान्तो जानुस्थापित कूर्परः ॥

सुष्टिभ्यां वस्त्र गर्भाभ्यां मन्त्रे गाढं निपीडयेत् ॥

Aṣṭāṅga-Hṛdaya Saṁhitā, I. xxvii.

² Paul. VI. lxxiii.

³ भीमाकारैर्नरैर्नागैर्दान्तेर्व्यालैश्च निर्व्विधैः ॥

भीषयेत् सततं पाशैः कशाभिर्व्वाय ताडयेत् ।

यन्मयित्वा सुषुप्तं वा चासयेत् दृषाग्निना ।

Suśruta Saṁhitā, VI. lxxii.

ABDOMINAL BINDER.

The use of cloth binder has been described before¹. Leather binder is to be used after the operation of paracentesis abdominis to apply pressure over the abdomen. After draining the fluid of ascites, the abdomen of the patient should be well wrapped with blankets, or silk cloth, or leather binder, for then the abdomen would not be flatulently distended by air.²

LEATHER BAGS.

The use of leather in the formation of bags of the vasti-yantra has been described before³.

ŚIRO-VASTI. LEATHER BAG FOR THE HEAD.

For application of oil on the head, Suśruta⁴ directs us to use a goat's bladder filled with medicated oil, just in the same way as ice bags are used nowadays.

Śārṅgadhara⁵ describes another variety of śiro-vasti: "It is

¹ See P. 181.

² निःसृते च दोषे गादतरमाविक काशिय चर्मणामप्यतमेन परिवेष्टयेद्दरं तथा नाभापयति वस्तुः ॥

Suśruta Samhitā, IV. xiv.

³ See P. 129-30.

⁴ अज्वासीनस्य वध्नीयाद् वस्त्रिकोषं ततो दृढं ।

Ibid, VI. xviii.

⁵ शिरोवस्तिविधिश्च प्रीत्यते सुश्रुतः ।

शिरोवस्तिचर्मणः स्वादिमुखो हादशाङ्गुलः ॥

शिरःप्रमाणं तं बद्धा मस्तके माषपिष्टकैः ॥

सन्निरोधन्विधायादौ केहेः कोणैः प्रपूरयेत् ॥

तावत् धार्यसु यावत् स्वाप्नासानेचमुखसु तिः ।

वेदनीयश्चो वापि मावाणां वा सदृशकम् ॥

Śārṅgadhara Saṅgraha, III. xi.

made of leather, has a length of twelve aṅguli and has two orifices or mouths. The leather bag is to be well tied round the head, the junction of the circumference of the bag and the skin should be well pasted with māṣa (Phaseolus Rox) glue. Then the cavity thus formed is to be filled with hot oily medicine. This is to be retained until the headache is relieved." Cakra-datta¹ also mentions it. The bag is described to be sixteen aṅguli high in the Yogaratnākara². Vāgbhaṭa³ advises us to use leather of a cow or buffalo, and it is said to have been twelve aṅguli broad.

LEATHER BAND.

In phlebotomy, a band is advised to be applied above the spot where the vein is to be punctured. This band is recommended to be made of cloth, or jute, or leather, or barks of

¹ आशिरो व्यायतं चर्मं कृत्वाटङ्गुलमुच्छ्रितम् ॥

तेनावेद्य शिरोऽधस्तान्माषकल्केन लिपयेत् ।

निश्चलस्रोपविष्टस्य तेलैरुष्णैः प्रपूरयेत् ॥

Cakradatta, Śiro-roga Cikitsā.

² आशिरो वापितचर्मं षोडशाङ्गुलमुच्छ्रितम् ।

तेनावेद्य शिरोऽधस्तान्माषकल्केन लिपयेत् ॥

Yogaratanākara, P. 402.

³ विधिसस्य निषण्णस्य पीठे जागुसमे वदी ।

यज्ञाक्तस्त्रिभुजस्य दिनान्ते गव्यमाह्वयम् ॥

द्वादशाङ्गुलविस्तीर्णं चर्मपट्टं शिरः समम् ।

आकर्ण्य बन्धनं स्थानं ललाटे वस्त्रं वेष्टिते ।

चैलवेणिकया बद्धा माषकल्केन लिपयेत् ॥

ततो यथाव्याधिं भृतं खेदं कोष्णं निषिचयेत् ।

ऊर्ध्वं केशभूमी यावद्द्विङ्गुलं धारयेच्च तम् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxii.

trees, or tendrils of twining plants¹; and it should not be applied either too tight or too loose. As for example, in phlebotomy in the foot, the *yantra-sātaka* or ligature should be applied below the knee-joint, while the band is to be tied round, at a distance of four *āṅguli* above the part selected for the operation.² *Vāgbhata*³ says: "In phlebotomy, a band is to be tied round the upper extremity, four *āṅguli* above the spot selected for opening the vein which is to be made prominent by pressing it upwards with the closed fist." *Cakradatta*⁴ also quotes it. *Vāgbhata*⁵ recommends us to use a cloth band to be tied round the leg, four *āṅguli* above the spot selected for opening the vein in the leg.

This band corresponds to the band of *Antyllus* used by the Greeks. *Antyllus* applies a ligature of two fingers'

¹ गावं वृक्षोपरि हृदं रज्ज्वा पट्टेन वा समम् ।

Aṣṭāṅga Hrdaya Saṁhitā, I. xxvi.

वस्त्रपट्टचर्मान्तर्वल्कललतानामन्यतमेन यन्त्रयित्वा नातिगाढं नातिशिथिलं शरीरं प्रदेशमासाद्य यथोक्तं शस्त्रं गृहीत्वा सिरां विच्छेत् ॥

Suśruta Saṁhitā, III. viii.

² तत्र पादव्यध्यसिरसा पादं समेक्ष्यते सुस्थिरं स्थापयित्वा न्य पादनीषत्सङ्कुचितमुच्चैः कृत्वा व्यध्यपादं जानुसन्धेरधः शटकेनानेध्यः हस्ताभ्यां प्रमीयः गुल्फं व्यध्यप्रदेशस्योपरि चतुरङ्गुलम् श्रोतदौनामन्यतमेन यद्वा पादासिरां विच्छेत् ॥

Ibid.

³ किञ्चिद्वस्त्रशिरां बाह्यावनाकुचितं कूर्परे ।

वद्वा सुखोपविष्टस्य सुष्टिमङ्गुष्ठं गर्भिणीम् ॥

ऊर्ध्वं वेध्यप्रदेशाच्च बट्टिकां चतुरङ्गुली ॥

Aṣṭāṅga Hrdaya Saṁhitā, I. xxvii.

⁴ *Cakradatta*, *Sira-vyādhādhikāra*.

⁵ पादे तु सुस्थितेष्वसाज्जानु सन्धेर्मिमीक्षिते ।

गाढं कराभ्यामागुल्फं चरणे तस्य चोपरि ॥

द्वितीये कुक्षिते किञ्चिदापदे हस्तवत्ततः ।

वद्वा विध्येत् सिरामित्तमनुत्तेष्वपि कल्पयेत् ॥

Aṣṭāṅga Hrdaya Saṁhitā, I. xxvii.

breadth round the arm in bleeding at the elbow, while to bleed at the ankle, the band is to be applied at the knee. It is mentioned as fillet in the pseudo-Hippocratic treatise on Ulcers;¹ and Oribasius² gives an interesting dissertation on the subject, principally condensed from the works of Herodotus, Antyllus and Galen. Paul³ also ties a narrow band round some muscular part of the arm before abstracting blood from the inner part of the elbow. "Wherefore we must tie a narrow band around some muscular part of the arm, and having by friction of the hands upon one another produced the necessary fulness of the vein, we divide it transversely, but only along its breadth."

LEATHER BOTTLES, JARS, MAŞAKA, etc.

Leather was used in the manufacture of bottles and jars. Leather maşaka for honey, Soma juice, and dadhi (curdled milk), is mentioned in the Rgveda⁴ and also in the Laws of Manu where

¹ Ulcers, iii. 328.

² Med. Collect., vii, Phlebotomy.

³ Paulus Aegineta. Adam's Trans. Bk. VI. Sec. XL.

⁴ इतेरिव तेऽहकमसु सखा ।

अच्छिद्रस्य दधन्वतः सुमुखस्य दधन्वतः ॥

Rgveda, 6 M. 48 S. 4 A. 8 Ch. 18 v.

यो ह वां सघ्नो हतिराहितो रघचर्षणे ।

ततः पिवन्मग्निना ॥

Ibid, 8 M. 5 S. 5 A. 8 Ch. 19 v.

अच्छिद्रं चन्वोर्भर सोमं पवित्रं वा सुत ।

नि वेष्टि गोरधिं लवि ॥

Ibid, 1 M. 28 S. 1 A. 2 Ch. 9 v.

एष सोमो अवि लवि गवां त्रीद्व्यदिभिः ।

इन्द्रं मदाय जीह्वत् ॥

Ibid, 9 M. 66 S. 7 A. 2 Ch. 29 v.

it is called *dr̥ti*¹. Leather *masaka* or inflated skins were in use as swimming bladders, and we have a representation of "figures with garlands in their hands, swimming and disporting themselves, supported on *masaks* or inflated skins."² In the *R̥gveda*, Agastya in his spell to neutralise poison, says: "I deposit the poison in the solar orb, like a leather bottle in the house of a vendor of spirits."³ Dr. Mitra points out that "other *sm̥rtis* ordain that oleaginous articles preserved in leather bottles do not become impure by the contact of the impure cowhide; and in the present day, jars of that material are in extensive use in Bengal and the North-West Provinces for the storage of oil and ghee. In the latter place, leather bags are universally used for raising water from wells, and

रवति भौमो हषभसविषया प्रहे प्रिमानो हरिषी विषवचः ।

आ योनिं सोमः सृजतं नि षीदति गन्धयो त्वग्भवति निषिङ्गवदी ॥

R̥gveda, 9 M. 70 R. 7 A. 2 Ch. 7 v.

एष स्य भागुरुदियति दुष्यते रथः परिष्मा दिवो अक्ष सजानि ।

प्रचासो अस्मिन्निधुना अक्षि चयो हतिस्तूरीयो मधुष्मो वि रप्यते ॥

Ibid, 4 M. 45 R. 3 A. 7 Ch. 1 v.

See Wilson's *R̥gveda*, II. 28.

¹ रन्द्रियाणां तु सर्वेषां यद्येकं चरतौन्द्रियम् ।

ततोऽस्य चरति प्रज्ञा हतेः पादादिवोदकम् ॥

Manu Sm̥hitā, II. 99.

"But when one among all his organs fails, by that single failure his knowledge of God passes away, as water flows through one hole in a leathern bottle."

Ibid, Jones' Translation

² Pl. xxxi. fig. 1. Fergusson's *Tree and Serpent Worship*, P. 127.

³ सूर्ये विषमा सजानि हतिं सुरावती गृहे ।

R̥gveda, 1 M. 19 R. 2 A. 5 Ch. 10 v.

⁴ *Ibid*, Wilson's Translation.

according to the law books of Śaṅkha and Likhita,¹ that water is declared pure which is kept in old leather bottles''². To this may be contrasted the prevailing Hindu notion that water is defiled if touched by a Brāhmana in his shoes. Though the leather is not allowed to be a material of dress of the Hindus, except his shoes which are considered as unclean, leather belts formed one of the eight sacred utensils necessary for a śramaṇa of the Buddhist order; and in the Manu Saṁhitā³ we find the students of theology advised to "wear for their mantles, the hides of black antelopes, of common deer, or of goats."⁴

5. ANTARVALKALA. THE INNER BARKS OF TREES.

Barks of trees are recommended to be used as splints for the support of fractured bones. In fractures of bones of the foot, leg and thigh, Suśruta directs us to use splints made of barks of trees⁵ to surround the limbs. In the treatment of a simple fracture, Bhāva Miśra advises us to use cold water first, then mud is to be applied, and lastly the fractured bones should be secured

¹ आपो रूपवद्गन्धवत्यः परिशुद्धं जीर्णचर्मकरण्डकैवभ्युद्धृताः ।

चर्मकरण्डः चर्मपुटः ।

Śaṅkha and Likhita.

² Dr. R. C. Mitra's Indo-Aryans. vol. II.

³ कार्णरौरववास्तानि चर्मणि ब्रह्मचारिणः ।

वसौरन्नानुपूर्वेण शायचीमाविकानि च ॥

Manu Saṁhitā, II. 41.

⁴ Ibid. Sir Wm. Jones' Translation. II. 41.

⁵ अभ्यज्य सर्पिषापादं तलभग्नं कुशोत्तरं ।

वस्त्रपट्टेन वस्त्रेयान्नच व्यायाममाचरेत् ॥

Suśruta Saṁhitā, IV. iii.

by splints and bandages.¹ In the *Yogarātnākara*², we are advised to treat fractures, by lowering the raised end and elevating the depressed end of the bone, and then by using splints and bandages to keep them in position. *Bhāva Mīśra*³ describes it similarly after *Suśruta*. *Suśruta* directs us to use barks of *Vata* (*Ficus Indica*. Rox.) and bamboo strips as splints to support the neck after reducing its dislocation by holding at the temporo-maxillary articulations on the sides and the occipital protuberance on the back, and raising him up in the air. He should lie down with his head raised for seven days⁴. In modern times, the Sayre's suspension apparatus and jury mast serve the same purpose.

The barks of *Madhuka* (*Bassia latifolia*), *Aśvattha* (*Ficus religiosa*), *Kukubha* (*Terminalia arjuna*), *Polāśa* (*Butea frondosa*, Rox.), *Udumbara* (*Ficus glomerata*, Rox.) bamboo, *sāla* (*Shorea robusta*), *Vata* (*Ficus Indica*. Rox.) are mentioned as

¹ 'आदौ भग्न' विदित्वा तु सेचयेच्छीतलागुना ।

पङ्कनालिपनङ्कार्यं' वन्धनञ्च कुर्यान्वितम् ॥

Bhāva Prakāśa, II. iii. *Bhagnādhikāra*.

² पङ्कनालिपनं कुर्याद्वन्धनं च कुर्यान्वितम् ।

अवनामितमुन्नत्योद्वतं चावपौडयेत् ॥

चित्रं द्विधापि च स्थाने संस्थाप्य विधिमाचरेत् ॥

Yogarātnākara, P. 345.

³ अवनामितमुन्नत्योद्वतं चावपौडयेत् ।

आच्छेदतिचित्रमधोगतञ्चोपरि वर्तयेत् ॥

Suśruta Saṁhitā, IV. iii.

Bhāva Prakāśa, II. iii. *Bhagnādhikāra*.

⁴ अवटावधङ्गन्तोश्च प्रष्टञ्चोन्नमयेन्नरं ।

तथा कुशान् समंदत्वा वस्त्रपट्टेन बध्नेद्वेत् ।

उत्तानं शाययेच्चैनं सप्तरात्रमन्तर्दिशः ॥

Suśruta Saṁhitā, IV. iii.

supplying the materials of splints¹. Bhāva Miśra² adds Kadamba (Anthocephalus cadamba), Hijjala (Barringtonia acutangula), Sarjja (Pinus longifolia) to the list. Such splints are called kuśa, and Vāgbhaṭa³ says that the splints should be broad, thin, pliant and clean.

Dr. Jacobi, of Dublin, says that he has seen an excellent splint made from the "fresh bark of a tree, taken off while the sap is rising". "It fits admirably", says he, "just like paste-board soaked in water"⁴. Dr. C. C. Jewet⁵ recommends for the same purpose the bark of leriodendron, or tulip tree.

THE CRUTCHES.

The crutches were used to help the crippled. In the Vajasaṇīya Saṁhitā of the White Yayurveda, there is a passage describing the different kinds of human victims, appropriated to particular gods and goddesses. The passage occurs also in the Taittirīya Brāhmaṇa with slight differences. There we

¹ मधूकीदुग्धराश्रित्य पलाश ककुभत्वचः ।

वंशसर्ज्या वटानां वा कुशार्थमुपसंहरेत् ॥

Suśruta Saṁhitā, IV. iii.

² मधुकीदुग्धराश्रित्य कदम्ब निचुलत्वचः ।

वंशसर्ज्यामृगानाञ्च कुशार्थमुपसंहरेत् ॥

Bhāva Prakāśa, II. iii. Bhagnūdrikāra.

³ कदम्बोदुग्धराश्रित्यसर्ज्यामृगैः पलाशजैः ।

वंशोद्भवै वा मृगभिस्तनुभिः सुनिवेष्टितैः ॥

सुशृङ्गैः सुप्रतिष्ठानै वैक्वलेः शकलेरपि ।

कुशाद्वयैः समं वन्धं पञ्चसोपरि योजयेत् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, VI. xxvii.

⁴ Hamilton's Fractures and Dislocations. 5th Ed. P. 50-51.

⁵ The 20th Mass. vols.

find "to the two (deities) who preside over the gains above or below one's expectation (utkula and vikula), a cripple, who can not move even with the help of a crutch" is recommended to be sacrificed. And again "to the divinity of land, a cripple who moves about on a crutch."¹

The use of the sound limb as a splint of support for the fractured bone of the opposite side was well known. Wooden splints resembling in shape the injured member are also recommended. Susruta says² that if the hand be fractured, it is to be tied with the opposite hand, but in fractures of both the hands, Gayadāssa³ recommends a wooden hand to be used as a splint for both. After union of the fractured bones, the hands should be made to hold balls of cow-dung, mud and stones.

6. LATĀ OR CREEPERS (TENDRILS OF).

The tendrils of creepers as materials of ligature are mentioned

¹ उत्कुलविकुलाभ्यां (उत्कुलविकुलिभ्यः) विश्विन ।

भूत्ये पीठसर्पिनमालभते ।

Taittirīya Brāhmaṇa.

Quoted in Mitra's Indo-Aryans. vol. II. P. 84—85.

² उमे तले समे कला तलभग्रस्य देहिनः ।

वध्नीयादामतैलेन परिकेच कारयेत् ।

प्राग् गोमयमयं पिण्डं धारयेन् स्रष्टव्यं ततः ।

इत्थे जातवलेचापि कुर्यात् पाण्

Susruta Saṁhitā, IV. iii.

³ अथोत्तु उमेऽपि हस्ततले तत्रेकस्य भङ्गे वामं दक्षिणेन दक्षिणं वामेन, उभयोस्तुभङ्गेन तलमेन, काष्ठमवेन कला इह अपि वध्नीयादेवं दार्ढ्यं भवतीति, स्रुत्पिण्डादिधारणमात्मकस्य प्रशस्तम् ।

Quoted in Dallana's Commentary, IV. iii.

by Suśruta. He recommends¹ to give up a patient, bit by a snake, as hopeless when he does not respond to the application of stimuli, such as cold water, tendrils of creepers, etc. Vāgbhaṭa² advises us to introduce the stalk of the lotus, with a thread tied to it, inside the throat to extract any foreign body stuck there. When the soft stalk is touched by the śālya, it should be extracted by the sudden withdrawal of the stalk and thread.

7. VASTRA OR CLOTH.

Cloth³ as a material of bandages, tents, gauze, etc. has been described before⁴.

8. AṢṬHĪLAŚMA. STONE OR PEBBLE.

It is a piece of stone—long and round. It is advised to be used for moving arrows fixed in the bone⁵. Caraka⁶ advises us to strike two pieces of stone against each other to resuscitate a

- ¹ अजीर्णं पिप्पातप पोडितेषु वालप्रमेहेष्वथ गर्भिणीषु ।
 वृद्धातुर क्षीणबुभुक्षितेषु रुक्षेषु भीरुष्वथ दुर्दिनेषु ॥
 शस्त्रक्षते यस्य न रक्तमस्ति राज्योलतामित्रं न स भवन्ति ।
 शोताभिराक्षिप्तं न रोम हृषीं विषाभिभूतं परिवर्जयेत् ॥

Suśruta Samhitā, V. iii.

- ² काण्डकोतो गते शल्यं सूत्रं काण्डे प्रवेशयेत् ।
 विसृज्य ततः शल्यं विसृज्य स्रवं स्रवं हरेत् ॥

Aṣṭāṅga Hṛdaya Samhitā, I. xxviii.

- ³ वस्त्रं प्रसिद्धं तूलकं सूदनिकितं वेष्टनार्थं प्रयुज्यते ॥

Vāgbhatārtha Kaumudī, I. xxv.

- ⁴ See P. 176-83.

- ⁵ अग्निप्रस्तरखण्डं शस्त्रपीडनार्थं निर्घातनाच्च युज्यते ॥

Ibid.

- ⁶ अग्निप्रस्तरखण्डं सर्वाङ्गानि शोतोदकेनोष्णोदकेन वा मुखपरिषेकः ।

Caraka Samhitā, IV. viii.

still-born child. In bleeding from the veins of the neck, Vāgbhata¹ advises the patient to hold firmly two pieces of stones in their hands.

A piece of stone is to be used by a person, for holding it with his hand, after recovery from fractures of the carpal and metatarsal bones².

In ancient times, in India, the kings used to decorate themselves with antidotary gems, as a safeguard against poisons.³ Even now the snake charmers apply a black stone on their bodies where they are wounded by the venomous reptile. This stone is popularly known as the vi-a-pāthara or poison-stone, and is supposed to have the property of extracting poison from the body.

9. MUDGARĀ. HAMMER.

Suśruta directs us to use a hammer or a piece of stone to strike an arrow firmly fixed in the bone, until loosened, when it can be conveniently extracted by means of a pair of forceps⁴. It should be pointed out that the tubular instrument—*sālya*

¹ पाषाणगर्भहस्तस्य जानुस्थे प्रच्यते भूजे ।

² कुचेरारभ्य सदिते विध्येहङ्गोर्ध्वपटके ॥

Aṣṭāṅga Hṛdaya Samhitā, I. xxvii.

³ See foot-note. 2. P. 196.

⁴ विषघ्नैरुदके स्नातो विषघ्नमणिभूषितः ।

परीक्षितं समन्नीयाग्नाङ्गुलाविद्धिषग्वृतः ॥

Kāmandakiya Nīṭisāra, Ch. vii. v. 10.

रचितो गङ्गुरोक्तांर मथिर्यस्य विमूषणं ।

स्थावरं जङ्गमं तस्य विषं निर्व्विषितां ब्रजेत् ॥

⁵ अस्थिदेशोपस्थित मष्टीलाङ्गुलसुङ्गराणामन्यतमस्य प्रहारेण विचाख्य यथामार्गमेवः

Suśrutā Samhitā, I. xxvii.

nirghātani—described before¹, served the same purpose. Vāgbhata also uses a hammer² to shake an arrow fixed in the bone, and directs us to extract it with the hands or by the various kinds of forceps³.

The Greeks used some iron instrument to shake such an arrow from the place where it was lodged. The hammer was also used by the Greeks and Romans but in a different capacity. Paul mentions its use in cranial surgery to strike the lenticular and gouge⁴. Paul and Celsus describe a "method of extracting foreign bodies from the ear by laying the patient on a board and striking the under side with a mallet."⁵ Vāgbhata describes this method for draining out water from the ear.⁶

10. PĀNIPĀDATA. THE PALM OF HAND AND SOLE OF FOOT.

11. AṅGULI OR FINGERS.

The surgeon's hand is considered by Suśruta to be the principal instrument as the use of all other instruments depends

¹ See P. 111.

² मुहुराङ्गुल्यो नाद्या निर्वात्योत्पुष्टितं हरेत् ।

तेरेव चानयेन्मार्गमार्गोत्पुष्टितं तु यत् ॥

Aṣṭāṅga Hrdaya Saṁhitā, I. xxviii.

³ अथाङ्गुलेत् करप्राशं करपैवेतरत् पुनः ।

दृश्यं सिंहादिमकरवर्णिं कर्कटकाननैः ॥

अदृश्यं वर्णसंस्थानाद् ग्रहीतुं शक्यते यतः ।

कङ्क शङ्खाङ्क कुरुरं शरारी वायसाननैः ॥

Ibid.

⁴ Paulus Ægineta VII. xc.

⁵ Milne, Graeco-Roman Surgical Instruments, p. 125.

⁶ कर्णोऽथु पूर्णं हस्तेन मथित्वा तैलवारिणी ।

चिपेदधोमुखं कर्णं हस्ताद्वा क्षमयेत् वा ॥

Aṣṭāṅga Hrdaya Saṁhitā, I. xxviii.

upon it¹. But again he mentions the hand and foot as accessory to, or substitutes for, the instruments. Longmore² says: "Of all instruments for making a complete examination of a gun-shot wound as well as for exploring for foreign bodies which may be lodged in it, the finger of the surgeon is the most appropriate, whenever a wound is large enough to admit of its insertion." There are many instances of the use of hand and foot in the treatment of surgical diseases but I shall point out a few of them.

1. Both Suśruta³ and Cakradatta⁴ say that "if a swelling be hard but slightly painful, then it should be well fomented, pressed and rubbed by a piece of bamboo, or palm of the hand, or thumb to cause its subsidence. Bhāva Miśra also quotes this verse⁵. Suśruta⁶ and Vāgbhaṭa⁷ recommend a similar treatment for enlarged glands.

¹ See foot note, P. 90.

² Longmore, Gun-shot Injuries, 1877, P. 319.

³ अभ्यज्य स्वेदयित्वा तु वेणुना वा शनैः शनैः ।

विमर्द्दयेन्निषक् प्राञ्जललिनाङ्गुष्ठकेन वा ॥

Suśruta Saṁhitā, IV. i.

⁴ अभ्यज्य स्वेदयित्वा च वेणुनाद्याततः शनैः ।

विस्त्रापनार्थं चङ्गीयात् तलिनाङ्गुष्ठकेन वा ॥

Cakradatta, Vraṇaśoṭha Cikitsā.

⁵ अभ्यज्य स्वेदयित्वा तु वेणुनाद्या शनैः शनैः ।

विमर्द्दयेन्निषङ्गसन्दललिनाङ्गुष्ठकेन वा ॥

Bhāva Prakāśa, II. iii.

⁶ हनेषु दोषेषु यथानुपूर्व्यं यत्नौ निषक् स्निग्धं समुत्थिते ।

सिद्धस्य विस्त्रापनमेव कुर्यादङ्गुष्ठलोहोपलवेण दृष्टैः ॥

Suśruta Saṁhitā, IV. xviii.

⁷ संस्वेद्य बहुशोयस्यं विचङ्गीयात् पुनः पुनः ।

Aṣṭāṅga Hṛdaya Saṁhitā, VI. xxx.

2. Suśruta says¹ that "when a morsel of food sticks in the throat, a blow should be fearlessly struck with the fist on the shoulder of the patient without his knowledge". Vāgbhaṭa² also describes it.

It is however curious to find that exactly the same procedure was adopted by Alsaharavius. Adams in his commentary³ on Paul says that "when a morsel of food sticks to the œsophagus, Alsaharavius directs that the person should be struck on the back, which will facilitate the descent of it".

3. In the reduction of dislocation of the lower jaw, Caraka used his fingers to do it exactly in the same way as recommended by the modern surgeons. He directs us to depress the lower jaw by the thumbs and at the same time to raise the chin by the index fingers⁴. The verses are quoted by Cakradatta.⁵ The description of the method, quoted from any modern text book, would be a good commentary on the above passage of Caraka. Erichsen says⁶: "The reduction is best effected, by the surgeon,

¹ यासश्च्येतु कण्ठासक्ते निःशङ्कमनवुद्धस्तन्वे मुष्टिनाभिद्वयात् खेहं मदां पानीयम्
वा पाययेत् ।

Suśruta Samhitā, I. xxvii.

² अप्पानं स्तन्वघाताभ्यां यासश्च्येतु प्रवेशयेत् ।

Aṣṭāṅga Hṛdaya Samhitā, I. xxviii.

³ Adam's Commentary on Paulus Ægineta, VI. xxxii.

⁴ व्याचानने हनुं स्निग्धमङ्गुल्याभ्यां प्रपीड्य च ।

प्रदेशिनीभ्याञ्चोन्नम्य चित्तुकोन्नमनं हितं ॥

सखां सङ्गमयेत् स्थानं सखां स्निग्धं विनामयेत् ।

प्रत्येकं स्थानदृष्ट्यादिक्रिया वैशेष्यमाचरेत् ॥

Caraka Samhitā, VI. xxviii.

⁵ Cakradatta, Vāṭabyādhi Cikitsā.

⁶ Surgery, Vol. II, p. 658.

standing before the patient, placing his thumbs, well protected by napkins, or a few turns of a narrow bandage, on the molar teeth on each side, and then depressing the angles of the jaw forcibly, at the same time that he raises the chin by means of his fingers spread out and placed underneath it."

4. Caraka says¹ : "After pairing her nails and covering the tip of her index finger with cotton, the nurse is to clean the palate, lips and throat of the new-born child".

With this passage we may compare what Barnes says on the point². "The attendant having then placed the child close to the mother, so as to avoid any strain on the cord, should cleanse its mouth from any fluids, such as blood and mucus, it may have partially swallowed during its passage through the vagina. This should be done at once, as such fluids drawn into the lung vesicles may give rise to inflammation of the lungs, or even septicaemia."

5. *Sūruta*³ recognises "six modes of diagnosing diseases, namely by the five senses i.e. by hearing, smell, taste, sight and touch, and by questions. "Symptoms discernible by the sense of touch are coolness or heat, smoothness or roughness, softness or hardness, and other tangible qualities of the skin in fever, dropsy,

¹ अथास्य तालोष्ठकण्ठं जिह्वाप्रसार्य नसारसेत् अङ्गुल्यामुपरिलिखितमखया सुप्रक्षालितो-
पधानकार्पासपिचुनया प्रथमं प्रसार्य तस्यास्य च शिरसाङ्गु कार्पासपिचुना जेहनर्मेन प्रति-
ष्ठादयेत् ।

Caraka Saṁhitā, IV. viii.

² Obstetric Medicine and Surgery, Vol. II, p. 105.

³ अङ्गुलौ हि रोगाणां विज्ञानोपायः । तदाया पञ्चभिः श्रोत्रादिभिः प्रश्नेन चेति ।

* * * * * स्पर्शनेन्द्रियविशेषाः श्रोत्रोष्ठकण्ठजिह्वादिष्वङ्गुलैश्च कर्कशमृदु कठिनमृदु तद्वै शिरसोपादिषु ।

Sūrutā Saṁhitā, I. x.

and other diseases." And we know how important it is to educate the tactile sense in the diagnosis of diseases.

6. The foot is recommended to fix a part of the human body whence any foreign body may be removed easily by the hands.¹ Suśruta says²: "If a foreign body cannot be easily extracted, as when it is impacted in the hollow or the substance of a bone, the part should be pressed by the feet, and it should be drawn out by the instrument." Vāgbhāṭa also gives a similar description³. Caraka describes a method of removal of the placenta if not spontaneously separated. One of the female attendants should press upon the navel of the puerpera forcibly with her right hand, while with the left hand placed upon her back, she should shake her. Then the heel is to be placed on the patient's buttock while the two sides of the gluteal regions are also to be pressed and shaken⁴.

12. JIHVĀ OR TONGUE.

The organ of taste as a means of diagnosis is noted by

¹ पाद इति पादेन शरीरदेशं धृत्वा हस्तादियन्त्रेण चरणादि क्रियते ।

Vāgbhāṭārtha Kaumudī, I. xxv.

² अस्थिविवरणविष्टं अस्थिविदष्टं वाऽवगच्छ पादाभ्यां यन्त्रेणापहरेत् ।

Suśruta Saṁhitā, I. xxvii.

³ अस्थिदष्टे नरं पदभ्यां पीडयित्वा विनिर्हरेत् ।

इत्यश्वक्वे सुवलिभिः सुगृहीतस्य किङ्करैः ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxviii.

⁴ तस्याश्च दमरा न प्रपन्ना स्यादयैनामन्यतमा स्त्री दक्षिणेन पाणिना नाभेरुपरिहासयत् निपीय सन्धेन पाणिना वृष्टत उपसंगृह्य सुनिर्द्धृतं निर्द्धृत्यात् । अथास्याः पादपार्श्वग्र-
भोक्षीणाकोटयेदस्याः स्निग्धानुपसंगृह्य सुपीडितं पीडयेत् ।

Caraka Saṁhitā, V.

Suśruta¹. "Symptoms discernible by the sense of taste are the various tastes noticeable in morbid secretions of urine and other diseases". Cakrapāṇi "explains that 'inference' is necessary, because the sense of taste can not be exercised by the physician on the patient directly;"² he must do it through some intermediate agents such as ants, whose attraction to sugar is well-known and so the presence of sugar in urinary diseases can be inferred."

13. DANTA OR TOOTH.

Ivory as a material of surgical instruments has been described before³. Suśruta⁴ advises us to use the ash of ivory with stibium as a stimulant to the growth of hair on a scar. It is also recommended by Vāgbhaṭa⁵.

14. NAKHA OR NAILS.

Suśruta advises the surgeon to use his nails⁶ for the operation of cutting, piercing and extraction, if these can be possibly helped by his nails.

In modern times, nails often help the surgeons in separating

¹ रसनेन्द्रियेभ्यः प्रमत्तादिषु रसवर्तिषाः ।

Aṣṭāṅga Hṛdaya Saṁhitā, I, x.

² Haerle's Commentary on the Suśruta Saṁhitā, I, x. (Bibliotheca Indica).

³ See page 67.

⁴ हृषीदन्तमयीं कृत्वा मुख्यदेहं रसाङ्गनं ।

रोमाक्षेतनं प्रायत्नं मेदाः पानितस्येष्वपि ॥

Suśruta Saṁhitā, IV, I.

⁵ तैलाका हृषीदन्तस्य मयी वा जीवधे परम् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, VI, xxiv.

⁶ आहार्यक्षेत्रमेयेषु नखं प्रक्षेप्य योजयेत् ।

Suśruta Saṁhitā, I, viii.

layers of tissues during operation as in the operation for the radical cure of hydrocele. We often extract thorns, impacted in our body, with our nails.

15. MUKHA OR MOUTH.

The use of mouth as a suction apparatus was well known to the ancients. Susruta advises us to use *ārā* or *pāṇimantha* (awl) to perforate bone in diseases of the medullary canal, caused by obstructed and deranged air. He next introduces one end of a tube, open at both ends, into the canal through the perforation in the bone, while through the other end the surgeon sucks out air by his mouth¹. The use of mouth for sucking out air through the *śrīga* or horn has been described before². Caraka says³ that the poison of a snake-bite may be sucked out by the surgeon's mouth, filled with flour or ash. Even in modern times, it is common amongst Indians to suck out blood, in accidental cuts by knives, by the mouth. The practice of the suckers in Europe has been noted before⁴.

16. VĀLA OR HAIR.

Horse-hair is to be used for applying ligatures round the piles⁵. It is also a material of suture for the skin. Horse-hair is also described to have been used for raising pterygium. Paul⁶ also used horse-hair to raise a pterygium.

¹ निरुद्धेऽस्थनि वा वायौ पाणिमन्थेन दारिते ।

नाडीं दन्तास्थनि निषक् चूषयेत् पवनं वली ॥

Susruta Saṁhitā, IV. iv.

² See P. 148-49.

³ दंशं वा चूषेन्मूत्रेण यवचूर्णपांशुपूणेन ।

Caraka Saṁhitā, VI. xxv.

⁴ See P. 149-50.

⁵ बालाः, अश्वदीनां पूच्छमवकीशः वृकेशाश्च अशी वात्यादि वन्धनार्थं युज्यते ।

Vāgbhaṭārtha Kaumudī, I. xxv.

⁶ Paulus Ægineta, VI. xviii.

Suśruta¹ says: "Bundles of hairs or tents are to be used in the treatment of wounds in the skull, formed by the extraction of an arrow from the brain. These would prevent the hernial protrusion of the cerebral substances from passing out through the wound. The hairs are to be removed one by one as the wound heals up gradually." Vāgbhata² also approves this treatment.

A bundle of hairs tied to a long thread is mentioned by Suśruta to have been used for the extraction of fish-bone from the throat³. The patient is directed to swallow the ball of hairs with some liquid. Next emetics are to be administered to excite vomiting. During this act, the foreign body gets entangled in the meshes of the ball, which being then suddenly pulled out by the thread outside, extracts the fish-bone satisfactorily. Vāgbhata⁴ also describes it similarly. For this purpose

- ¹ शिरसोऽपहतं ब्रह्मं बालवर्णिं प्रवेष्टयेत् ।
बालवर्णान्दत्तयां मसालुङ्गं ब्रह्मन् कर्षेत् ॥

Suśruta Samhitā, IV. 11

- ² काव्यां ब्रह्माहतं विद्धे भद्रादिबलितं क्षिप्रम् ।
शिरसोऽपहतं ब्रह्मं बालवर्णिं प्रवेष्टयेत् ॥
• मसालुङ्गमुते मुञ्चो हन्वादिनं चलीगन्धवा ।
ब्रह्मे रोहति वैद्यैर्ब्रह्मेणैवपमयेत् कषणम् ।
मसालुङ्गमुतोः खादिभक्षिभान्मन्त्रोपमान् ॥

Aśāṅga Hrdaya Samhitā, VI. xxvi

- ³ अस्त्रियस्त्रयमथवा तिर्यक्कण्ठासन्नमथैवा कोशोऽपहृतं हृदये स्रवणम् इत्युक्तौर्ध्वं
अथयदेकाकण्ठास पूर्यकोष्ठं बालयेवमतश्च ब्रह्मं कर्षयेत्सर्वम् इत्युक्ता कर्षयेत् ।

Suśruta Samhitā, I. xxvii

- ⁴ कोशोऽपहृतं पीतम् इवैः कण्ठकलापयेत् ।
स्रवसा स्रवणेन बलत कोशं पीतम् ॥

Aśāṅga Hrdaya Samhitā, I. xxviii.

a tooth brush formed by chewing the end of a narrow branch of a tree is also recommended¹. A common domestic remedy is to make the patients swallow large morsels of boiled rice, plantain, etc.

Paul² mentions a similar contrivance, and says: "Some are of opinion that the patient ought to be made to swallow large morsels, such as stalk of lettuces or pieces of bread; but others direct us to bind a thread about a small piece of clean soft sponge and give it to the patient to swallow, and then taking hold of the thread to draw it up, and to do this frequently in order that the thorn may get fixed in the sponge and be brought up". For this purpose Aetius used the epilation forceps. Paul calls it *acanthobolus* or the fish-bone forceps.

The modern surgeons use a probang for the same object. "Small sharp bodies, such as bristles, fish-bones, or pins, are generally found sticking between the pillars of the fauces and the tonsils." Such bodies "should not be pushed on, but an endeavour should be made to catch them with the "horse-hair probang." This being pushed gently, unexpanded, beyond the point where the pin or bone is stuck, is expanded by pulling up the handle and then withdrawn with a slight rotatory motion."³

Caraka⁴ mentions the practice amongst the recently delivered

¹ मृदुना वा दन्तधावनकुञ्चकेनापहरित् ।

Susruta Samhitā, I. xxvii.

² Pāulus Ægineta, VI. xxxi.

³ Swain's *Surgical Emergencies*, 3rd ed., Pp. 32-33.

⁴ कक्षायां बालवैश्या कच्छतासु परिश्रेत् ।

Caraka Samhitā, IV. xviii.

women to push a braid of her hair into her throat, to help the expulsion of the placenta. So in the *Yogarātnākara*¹, her throat is advised to be rubbed by a finger surrounded by hairs. This practice is still prevalent among the women of Bengal to a certain extent.

SUTURE MATERIAL.

Horse-hair was the material used by the Hindus for sutures. Besides it, they used² sutures of fine thread, or the fibres of the bark of *Asmantaka* (*Cæsalpina digynia*), or threads made of hemp or flax, or of the fibres of which bow-strings were made, or of the fibres of the *Mūrvā* (*Sansevieria zeylanica*) or *Guḍūcī* (*Tinspora cordifolia*). Besides these, the Hindu surgeons used the mouth parts of the ants as clasps to close incisions on the intestines. *Suśruta*³ describes the use of living black ants to close the incisions on the walls of the intestines, during the operation for intestinal obstruction, after removing the seybali, stones, etc. He advises us to remove the bodies of the ants, leaving their heads fixed on the margins of the incision,

¹ केशवेष्टित्याङ्गुला तस्याः कण्ठं प्रचर्षयेत् ।

Yogarātnākara, P. 437.

² सीव्येत् सूक्ष्मेण सूत्रेण वल्केनाश्मन्तकस्य वा ।

सज्जन्तौनसूत्राभ्यां स्नाया वासिन वा पुनः ॥

मूर्खान्गुडुचीतानैर्वा ।

Suśruta Samhitā, I. xxv.

स्नाया सूत्रेण वल्कलेः ।

सीव्येन्न दूर्ध्वं नासन्ने गृह्णाद्वात्यं न वा बहु ॥

Aṣṭāṅga Hṛdaya Samhitā, I. xxix.

³ परित्वाविष्टयेवमेव श्लेष्मदुत्पान्नास्त्रादान् संशीघ्रं तच्छिद्रमन्नं समाधाय कृत्वा-
पिपीलिकाभिर्दृश्येत् दष्टे च तासां कायानपहरेन्न सिरांसि ततः पूर्व्ववत् सीव्येत् ।

Suśruta Samhitā, IV. xiv.

in the act of biting. Then the intestines should be replaced with the ants' heads sticking to them. Caraka¹ also describes the use of ants for obliteration of small perforations in the intestines, but he takes away the ants before replacing the gut into the abdominal cavity. If by any accident, the abdominal muscles be incised and the intestines come out of a gaping wound, Suśruta recommends us to allow black ants to bite the exposed coils of intestines before replacing them into the abdomen². This is a curious practice of ancient surgery of the Hindus. The Greeks and Arabs never mentioned it. "Amongst some Indian tribes, it is customary to allow both edges of a wound to be seized by the sharp head-nippers of certain ants, whose bodies are then rapidly cut off; one ant after another being used, the wound is closed."³

Suśruta describes four sorts of sutures, *viz*:

1. Vellitaka or winding.
2. Gophanikā or like a sling.
3. Tunna sevanī or continued sutures.
4. Rjugranthi or interrupted sutures.

¹ क्षिद्राण्यन्तस्य तु स्थूलैर्दंशयित्वा पिपीलिकैः ।

बहुशः संगृहीतानि मत्वा ष्छित्वा पिपीलिकान् ।

प्रतियोगैः प्रवेष्ट्यान् बहिः सीञ्चेद् व्रणं ततः ॥

Caraka Saṁhitā, VI. xviii.

² अभिन्नमन्त्रं निष्क्रान्तं प्रवेष्टुं नाम्यथा भवेत् ।

पिपीलिकाशिरोरसं तदाप्येके वदन्ति तु ॥

प्रक्षाल्य पयसा दिग्घ्नं दृष्यशीघ्रित पांशुभिः ।

प्रवेशयेत् कृत्तनखो घृतेनाक्तं शनैः शनैः ॥

Suśruta Saṁhitā, IV. ii.

³ Neuburger's History of Medicine. Playfair's Translation, Vol. I., P. 9

These are advised to be so applied as they may suit the different parts of the body¹. The needles must not be introduced either too far from, or too close to the edges of the wound. In the former case, the lips of the wound shall be inflamed and so cause pain, while in the latter, the sutures will give way”.

The use of horse-hair as a material for suturing wounds was unknown to the Greeks and Romans. They used sutures of flax and woollen threads for wounds. Paul says: “Afterwards we unite the separated parts with a needle containing a woollen thread, being satisfied with two sutures.”² Celsus³ advises us to use sutures of soft thread; and the apolinose of Hippocrates⁴ is directed to be made of crude flax.

17. AŚVAKAṬAKA. THE RING OF A HORSE’S BRIDLE.

Suśruta says that when the arrow is firmly fixed in the bone and if it can not be extracted by forcible pulling by hands or instruments, it should be tied to the ring of a horse’s bridle. Then the animal is to be whipped, when by the sudden movement of the horse, the weapon would be jerked out of the wound⁵.

18. ŚĀKHĀ OR BRANCH OF A TREE.

Another method is to tie such an arrow by means of a rope

¹ सौव्येद्वेक्षितकं शनैः ।

सौव्येद्वेक्षितकं वापि सौव्येद्वा तुमुनेवनी ।

चतुर्गुण्यमथो वापि यथायोगमथापि वा ॥

Suśruta Samhitā, I. xxv.

² Paulus Aegineta, VI. xii. Adam’s Translations.

³ Celsus, V. xxvi.

⁴ Hippocrates, iii. 132.

⁵ अथर्वकटकके वा वक्षीयादथैनं कथया ताडयेद्यशोन्नमयन् शिरोविनेन शल्यमुद्धरति ।

Suśruta Samhitā, I. xxvii.

to the branch of a tree, lowered by pressure¹. When the pressure is released, the branch suddenly goes high up, and thereby it pulls the weapon out of the wound². Dallana, however, mentions another view that a bridle-ring and a branch of a tree are both required for the extraction of foreign bodies³. Hoernle remarks: "The branch apparently is put through the ring to afford a stronger pull"⁴. Vāgbhata⁵ also mentions these contrivances.

19. ŚTHĪVANA OR SPITTLE.

Dallana⁶ understands by it—"throwing out expectoration and saliva by the mouth." By this means any foreign body lodged in the oral cavity, such as in the gums, fauces, may easily be got rid of.

¹ दृढ़ां वा वृक्षशाखामवनस्य तासां पूर्ववदवज्जोद्धरेत् ।

Suśruta Saṁhitā, I. xxvii.

² शाखा, वृक्षशाखा, वृक्षायास विनमितायां शाखायां शल्यापभागं दृढं बद्धा, सहसा शाखात्यागेन उच्छ्रितया शाखया शल्यमुन्नियते ।

Vāgbhataṛtha Kaumudī, I. xxv.

³ अन्ये त्वेवं पठन्ति अशक्यमेवं वा बलवद्भिः सुपरिगृह्यतस्य यन्त्रे यैनं शाहयित्वा शल्य-
भावज्जं प्रविभूज्य धनुर्गुनैर्वज्जैकतःशाखावृक्षकटके वस्त्रेयात् । अथैनम् इत्यत्र कारकेक
पाठः कथया ताडयेत् यथोन्नमयन् शिरोवेगेन शल्यमुद्धरेति, नमितायां पञ्चाङ्गां वृक्षशाखायां
व पूर्ववद वज्जोद्धरेदिति ॥

Nivandha Saṁgraha, I. xxvii.

⁴ The Suśruta Saṁhitā. Bibliotheca Indica. P. 48. foot note 109.

⁵ तथाप्यशक्ये वारङ्गं वस्त्रीकृत्य धनुर्गुण्या ।

सुवज्जं वृक्षकटके वस्त्रेयात् सुसमाहितः ॥

सुसंयतस्यः पञ्चाङ्गा बाजिनः कशायथ तम् ।

ताडयेदिति सूत्रान् वेगेनोन्नमयन् यथा ॥

उद्धरेच्छल्यमेवं वा शाखायां कल्ययेत्तरोः ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxviii.

⁶ शीवणं स्त्रेयादिनिरसनम् ।

Nivandha Saṁgraha, I. vii.

20. PROVĀHANA OR FLUXING THE PATIENT.

This comprises the acts of emesis, purgation and lacrymal secretion. Thus the foreign bodies lodged in the alimentary canal or eyes may be got rid of by causing discharges from the bowels, the stomach, or the eyes¹.

21. HARṢA OR OBJECTS EXCITING HAPPINESS.

Persons suffering from vṛāṇa or wound are directed to have their minds in a state of cheerfulness by the sight of objects exciting happiness². A cheerful man is a better subject for a surgical operation than a morose and gloomy one. Vāgbhaṭa³ adds fear as an accessory instrument. Joy and fear cause a sudden change in the temper of a man and so may be of some help in curing diseases⁴. Suśruta regards, sorrow as a śālya or foreign body which is to be removed by joy.⁵

22. AYASKĀNTA OR LOAD-STONE.

Magnet was known to the ancient Hindus⁶ and they used it

¹ तदाशुचवधूद्धार कास मूत्र पूरीषानिलैः स्वभावबलप्रवृत्तै नयनादिभ्यः पतति ।

Suśruta Sāṃhitā, I. xxvii.

² सुहृदो विचिपन्त्याय कथाभिर्भ्रणवेदनाः ।

आश्वासयन्तो बहुशस्त्रगुक्ताः प्रियम्बदाः ॥

* * * *

सम्पदायगुक्ताभिः कथाभिः प्रीतिनानसः ।

आश्वान् व्याधिमोचाय चिम् सुखमवाप्नुयात् ॥

Suśruta Saṃhitā, I. xix.

³ See foot-note 1, P. 98.

⁴ भय हर्षौ शरीरस्य सहसा भावान्तरमुत्पादयन्तौ यन्त्रकार्यं कुरुत इति ।

Vāgbhaṭārtha Kaumudī, I. xxv.

⁵ हृद्यवस्थित मनेक कारणीतृपन्नं शोकशब्दं हर्षयेति ।

Suśruta Sāṃhitā, I. xxvii.

⁶ मणिगमनं सूच्यमिदं पण्डितदृष्टकारणकं ।

Yaiśeṣikā Darśanam, Ch. V, Āhnikā 15.

to extract minute foreign bodies such as iron particles from the eyes and teeth. Suśruta¹ also mentions its use for extracting an arrow from the wound, if it be without barbs.

In modern times, a magnet is still used for removing a particle of iron from the eye. "Indeed, cases have occurred in which the application of an inch bar-magnet connected with four Grove's cells to the outside of the cornea has caused the foreign body to retrace its course and emerge through the wound"². A fragment of iron lying in the vitreous has been removed by the Snell's electro-magnet introduced through the scleral wound behind the ciliary region. "The following plan of ascertaining whether a portion of needle be really impacted has been suggested by Marshall, and successfully carried into practice by Littlewood of Leeds. A powerful magnet is to be held upon the part for a quarter of an hour, so as to magnetise the fragment; a firmly hung polarised needle should then be suspended over it, when, if any iron is present, deflection will ensue."³

23. KṢĀRA. CAUSTICS OR POTENTIAL CAUTERY.

Caustics were highly extolled by the ancient surgeons as the external applications are better tolerated by the weak and

सूक्ष्मसर्पणमिति सूचीपदेन लौहमात्रं दृष्योपलक्षयति: तथा चायस्कानामिसुखं
यत् सूचादिर्गमनं * * * * *

Saṅkara Miśra, Upaskāra.

¹ अशुचीमनववहकर्मनल्य ब्रह्मसुखमयस्कान्तेन ।

Suśruta Samhitā, I. xxvii.

² Carter's Ophthalmic Surgery, 2nd ed., P. 369.

³ Erichsen's Surgery, Vol. I, P. 343.

timid persons who are afraid of the surgeon's knife¹; though Suśruta² distinctly states: "The following persons should not be treated with caustics: weak people, children, old and timid people, etc." They even give them preference to the knife for they argue that surgical diseases are radically cured by the application of the caustics, without any possibility of recurrence. Suśruta says³: "Of all cutting instruments and their substitutes, caustics (or vegetable alkalis) are the most important, because by means of them deep and superficial incisions and scarifications may be made, derangements of the three humours may be rectified and some diseases can be treated with special advantage."⁴

For the preparation and uses of caustics, see the Suśruta Saṁhitā, I. xi.

For the application of potential cauteries, three classes of instruments are recommended.⁵

1. Darvī—it is to be made of wood and should resemble a spoon in appearance.

¹ अल्पसलेऽवले वाली पाके चातर्था सुद्धते ।

दारणं मर्मं सम्यादिस्थिते चान्यत्र पाटनं ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxix.

² अथनैते चारुक्त्वाः । तद्यथा दुर्बलवाल स्थविर भौरुसर्वाङ्ग शूनोदरि रक्तपित्ति-
गार्भिन्युत्तुमती प्रवहज्वरि प्रमेहोरः क्षतक्षीनदृष्टा सूक्ष्मोपद्रुतक्षीवापहचोदृत्त फलयोनयः ॥

Suśruta Saṁhitā, I. xi.

³ शस्त्रानुशस्त्रेभ्यः चारः प्रधानतमच्छेद्यभेदालेख्य कारणाविदोषन्नत्वाद्विशेषक्रियावचाराणाञ्च ।

Suśruta Saṁhitā, I. xi.

⁴ Ibid. Hoernle's Trans. Bibliotheca Indica.

⁵ आखाय च दुर्बलैश्च शलाकानामन्यतमेन चारं पातयेत् ।

Suśruta Saṁhitā, IV. vi.

2. Śalākā or rods,—plain probes are mentioned for application of caustic lotions to parts of the body. But generally the ends of the probes are shaped like spoon. To this class belongs the three spoon-like probes of Suśruta and the three nail-shaped probes of Vāgbhaṭa, described before¹.

3. Kūreca,—it is a brush-like instrument.

The application of caustics has its advantages and disadvantages; and these are to be considered in their relations to the pre-anæsthetic periods of surgery. Patients are still less terrified by their application than by surgical incisions. The real value of caustics is thus summed up by Velpeau.² "Nevertheless caustics possess some advantages which can not be denied them. As they do not give the idea of an operation, they shake less the minds of the patients, they are accepted with more calmness and with infinitely less effort, than the action of the knife. Mortifying the tissues step by step, they give rise to no effusion of blood, and affect less deeply the economy than the operation, properly so called. Women treated in this way do not require to remain in bed or to consider themselves as patients. The dressings require little care, and do not demand absolutely the intervention of the surgeon. The wound cleans itself very rapidly in general, and once cleaned, it proceeds speedily towards cicatrisation. Without exempting wholly erysipelas, phlebitis or purulent infection as some surgeons have asserted, there is notwithstanding, some reason for supposing that they expose the patient somewhat less to these troublesome complications than the operation".

¹ See P. 158-159.

² Velpeau. Cancer of the breast. Marsden's trans.

25. AGNI. ACTUAL CAUTERY.

Suśruta says¹: "With regard to surgical treatment actual cautery is said to be superior to caustics, in as much diseases treated with the actual cautery do not re-appear, as because it can cure diseases which are incurable by medicinal instruments, and caustics."² This partiality for cauteries is one of the reasons of the gradual decadence of Hindu surgery and its total extinction in the present time. To this belief the Hindus may be compared the following aphorism of Hippocrates³:—

"Those diseases which medicine do not cure, the knife cures; those which iron can not cure, fire cures; and those which fire can not cure, are to be reckoned wholly incurable".

For the application of the actual cautery the following articles are considered necessary⁴:—

1. Pippali or piper longum
2. Goat's dung
3. Teeth of a cow
4. Śarā or saccharum sara
5. Probes or śalākā (see before⁵)

} These are to be used for diseases of the skin.

¹ चारादग्निर्गरीयान् क्रियासु व्याख्यातस्तद्ग्रन्थानां रोगानामपुर्णभावहेतुषु जशस्त्रचारैरसाध्यानां तत्साध्यत्वाच्च ।

Suśruta Samhitā, I. xii.

² Ibid. Hoernle's Trans. Biblio. Ind.

³ The Works of Hippocrates. Syd. Soc., vol. II., p. 774.

⁴ अथेमनि दहनोपकरणानि । तद्यथा पिपपल्यजाशक्कोदन्त शरशलाका जाम्बवौहेतर लीङ्हाः चौद्रगुदसेहाश्च । तत्र पिपपल्यजाशक्कोदन्त शरशलाकास्त्वगतानां । जाम्बवौहेतर-लोहानि मांसगतानां चौद्रगुदसेहाः सिरस्त्रायु सम्यस्त्रिगतानां ।

⁵ See P. 159-60.

Suśruta Samhitā, I. xii.

- | | |
|------------------------------|---|
| 6. Jāmvavauṣṭha ¹ | } Used for diseases of the muscles. |
| 7. Different kinds of iron | |
| 8. Honey ² | } Used for diseases of the vessels, joints and ligaments. |
| 9. Treacle | |
| 10. Ghee | |
| 11. Oil | |

"Both Actius and Oribasius represent goat's dung, pounded with vinegar, as being equally efficacious as the sinapism, and applying particularly to ischiatic diseases."³ Hippocrates says that cauterisation may be performed with boxwood spindles dipped in boiling oil.⁴ In Kordofan, are used "*El kamaia*, primitive instruments used for cauterisation consisting of a piece of camel's or sheep's dung dried and impaled on a long thorn."⁵

12. Cautery knife.—This is to be used in the treatment of prolapse of the omentum in cases of abdominal injuries. The

¹ अथो भगन्दरयन्याङ्गीदृष्टव्रणादिषु ।

मांसदाहो मधुमेहो जाल्मवीट गुडादिभिः ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxx.

² मधुक्लिष्टेन तैलेन मज्जसौद्रवसाद्यतैः ।

ततैर्वा विविधैर्लोहेर्दहैर्हृद्वा विशेषवित् ॥

Caraka Saṁhitā, VI. xiii.

³ Adams' Commentary on Paul, vol. iii. bk. vii. sec. xix.

⁴ Hippocrates, ii. 482.

⁵ Medical Practices in Kordofan, Third Report. Wellcome Research Laboratory, Khartoum.

prolapsed part is to be ligatured well and the cautery knife used to remove the prolapse below the ligature¹.

Cautery knife was also known to the Greeks and Romans Galen², speaking of cancer, says that "some use heated razor blades, at once cutting and burning". Paul³ also mentions a sword shaped cautery in the radical cure of hydrocele.

13. Plates of copper, lead or iron.—In the application of both kinds of cauteries, plates of these metals are to be used to surround a tumour to prevent injury to the adjacent structure (Suśruta).⁴

Hippocrates⁵ in the treatment of nasal polypus, says that "when that occurs we must insert a tube and cauterise with three or four irons". Celsus⁶ says that this tube may be a calamus or a tube of pottery.

14. Cakradatta mentions a probe of gold for applying actual cautery to the hair follicles after the removal of the eyelashes, to prevent a recurrence of trichiasis.⁷

Albucasis similarly recommends burning the roots of hair

¹ उदरान्मिदसौ वर्त्ति निगता यस्य देहिनि ।

कषायमव्यस्यत्कौण्ठो वज्रा सूत्रेण सुववित् ।

अग्निमतेन शस्त्रेणश्चिन्त्यान्मधुसमायुतं ॥

Suśruta Saṁhitā, IV. ii.

² Galen, xiv. 786.

³ Paul, vi. lxii.

⁴ यदव्यस्यत् वपुतामसीस पट्टेः समावेष्टा तदायसैव्वा ।

चाराग्रिश्चाथ सक्तद्विदध्यात् प्राणानहिंसन् भिषग्प्रमत्तः ॥

Suśruta Saṁhitā, IV. xiii.

⁵ Hippocrates, ii. 244.

⁶ Celsus, vii. x.

⁷ See foot-note 2, p. 66.

in trichiasis with a probe of gold. Paul¹ applies a heated olivary probe or an aural probe for the same purpose. Haly Abbas and Rhazes also describe this operation.

26. BHEṢAJA OR MEDICINES.

This means such medicines as become necessary in the treatment of surgical diseases and do the work of surgical instruments to a certain extent. Suśruta gives a list of medicines,² required in the treatment of various kinds of inflammations, and I quote a few passages from the English translation³ to illustrate the action of medicines in surgical practice. "Warm poultices made of the following drugs promote suppuration, namely, fruits of *sana* (*Crotalaria juncea*), *Mūlaka* (*Raphanus sativus*), *Śigru* (*Moringa pterygosperma*), seasum and mustard seeds, flour of barley and wheat, *kiṇva* (the drugs used as a ferment in distilling spirits) and linseed. The following medicines are applied for opening abscesses, namely, *chiravilva* (*Pongamia glabra*), *agnika* (*Semicarpus anacardium*), *chitraka* (*Plumbago Zeylanica*), *danti* (*Baliopermum montanum*), *hayamāraka* (*Nerium odorum*), and the excrement of the pigeon, vulture and heron. Caustic alkalies are also very effectual in opening abscesses. Demulcent articles, such as, flour of barley, wheat or *māsha* (pulse of *Phaseolus Rux.*) promote discharge from the interior of abscesses. * * * * Pastils for fumigating ulcers should be made of *śriveshtaṭṭka* gum of (*Boswellia Thurifera*), *sarjarasa* (resin of *Shorea robusta*), *sarala* (*Pinus longifolia*), and *devadāru* (*Cedrus*

¹ Paul viii. xiii.

² See Suśruta Saṁhitā, I. xxxvi.

³ Dr. U. C. Dutt's Translation, Bibliotheca Indica. P. 151-154.

deodara); decoctions or cold infusions of astringent and unirritating barks should be used as washes for promoting granulations in ulcer. Tents for promoting granulations should be made of *soma* (*Sarcostemma brevistigma*), *amṛita* (*Cocculus cordifolius*), *aśvagandhā* (*Withania somnifera*), the plants included under the class of *kākolādi*, and the buds of (*Ficus Bengalensis*)”.

In treating inflammation, the Hindu surgeons used pastes to give relief to the pain and tension; warm poultices to promote suppuration; medicinal applications and incisions by knife for opening abscesses; demulcent articles to promote discharges; decoctions of drugs as corrective washes; tents of drugs and lints for introducing them into the cavities of the abscesses; decoctions in oils and clarified butter to improve the character of ulcers; pastils for fumigating sores; tents, pastes, powders and lotions for promoting granulations; drugs to repress high granulations; drainage to prevent infection, and bandages to give the part rest. This shows that the Hindus were not wholly ignorant of the antiseptic methods of treating wounds; and Suśruta enjoins that a certain incense should be kept burning in the operation room.

Of the additions to the list of Suśruta by Vāgbhaṭa, we need consider the goat's gut only.

GOAT'S GUT.

The intestines of the goats, etc. are to be dried and prepared as materials of ligature¹. They should be used in ligaturing fine vessels after incision by knife, evidently to check hæmorrhage.

¹ See foot-note 1, P. 223.

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The use of goat's gut in surgery is generally considered to have been unknown to the Greeks and Romans, as it is not mentioned in their works. But Adams points out¹ "that the strings of ancient harp were made of the guts of a sheep," and this he clearly proves from a passage in the *Odyssey* of Homer.

Hippocrates² used apolinose made of crude flax, which is also mentioned by Paul for the delegation of arteries. Rhases however describes the use of strings of harp³ as a material for suture in the operation called *gastrophé*.

ARREST OF HÆMORRHAGE.

It is generally believed and often stated in modern works on surgery that the ancients were unacquainted with the proper treatment of hæmorrhage. *Suśruta* however enumerates four different ways of arresting hæmorrhage after venesection; namely:

1. *Sandhāna*:—Contraction of the wound by astringent decoctions of Chebulic Myrobolan and the root-barks of the *panchavalkala* trees (five barks).
2. *Skandana*:—or thickening of the blood by the application of severe cold.
3. *Pāchana*:—or desiccating or drying up the wound by ashes.
4. *Dahana*:—or cauterising the veins to make them shrink⁴.

¹ See Commentary on Paul, VI. lii. vol. II, P. 345. Syd. Soc. Ed.

² Hippocrates, iii. 132.

³ Rhases. Cont. xxviii.

⁴ अतुल्यं यदि तद्धि रुचिरस्य निवारणं ।

सन्धानं स्कन्दनञ्चैव पाचनं दहनं तथा ।

If the blood does not thicken by the application of cold, astringents should be applied; if these fail ashes should be used. By means of these three modes, the physician should endeavour to the best of his abilities to stop the bleeding, but if success be not still obtained, cautery may be resorted to as the absolute effective means¹. To stop bleeding from an artery, he advises us to apply astringents and pressure with the fingers. Vāgbhata² also describes these methods of arresting hæmorrhage, and advises us that if the ordinary means do not check the bleeding, the vessel must be again opened at a point in its course beyond the bleeding area, or actual cautery applied. Cakradatta also repeats these directions³.

Vāgbhata however mentions the sheep's gut amongst the accessory instruments. His commentator explains its use for

व्रणः कषायः सन्धत्ते रक्तं क्लन्दयते हिमं ।

तथा सन्धाचयेद्वा दाहः सङ्घीचयेत् शिराः ॥

Suśruta Saṁhitā, I. xiv.

¹ अक्लन्दमाने रुधिरं सन्धानानि प्रयोजयेत् ।

सन्धाने अश्रयमाने तु पाचनेः समुपप्लवरेत् ॥

कल्पेरितैस्त्रिभिर्वेद्यः प्रयतेत यथाविधि ।

असिहिमत्सु चैतेषु दाहः परमं इष्यते ॥

Ibid.

² रक्ते त्वतिष्ठति चिमं सन्धानीमाचरेत् क्रियात् ।

क्षौद्रं प्रियङ्गुं पक्ष्मं साषयव्याहं गोरिकैः ॥

वृत्तकपालाञ्जनचौम मषी क्षीरीलगङ्गुरैः ।

विचूर्णयेद् व्रणमुखं पक्ष्मादि-हिमं पिबेत् ॥

ताम्रं वा शिरां विध्यैद्वाधान् तस्मादनन्तरं ।

शिरामुखं वा त्वरितं दहेत् तत्रशलाकया ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvii.

³ See Cakradatta, *Śirāvyādhādhikāra*.

ligaturing blood-vessels¹. Suśruta says that if in venesection, or in treating wounds, excessive bleeding occurs, it should be stopped by proper means².

Celsus³ advises us to fill up the wound with dry pledgets, then to apply a sponge squeezed out of cold water and to press with the hand. If not successful, cut the vessel asunder between two ligatures, or apply cautery, or try the method of revulsion. Galen⁴ applies pressure by finger on the wounded vessel, or twists it moderately. If the vessel be an artery, he gives the alternative of a ligature or cutting across. Paul⁵ mentions all the methods to stop the bleeding, viz., pressure, styptics, ligature, escharotics, and cauteries with fire.

Albucasis⁶ mentions four methods of stopping the discharge of blood from an artery :

1. By cautery.
2. By dividing the artery across.
3. By using the ligature.
4. By styptics and bandage.

Avicenna⁷, Rhases⁸ and others also mention these methods

¹ अन्नं मेषादीनां यन्मात्रं तांस्तस्यात् शस्त्रच्छेदानन्तरं सूक्ष्मसिरादिवन्धनादिभि युज्यते ।

Vāgbhaṭārtha Kaumudī, I, xxv.

² वेधेन निमित्तैर्बहुधा शोनिते प्रसृते र्धमं ।

कार्थ्यं यद्योक्तं वैद्येन शोनितस्यापनं भवेत् ॥

Suśruta Saṁhitā, IV, i.

³ Celsus, v. 26.

⁴ Galen. Meth. Med. v.

⁵ Paulus Aegineta, IV. lii. vol. II. P. 127. Syd. Soc. Ed.

⁶ Albucasis. Chirrug. i. 58.

⁷ Avicennæ Cantic. ii. 2., and Collig. vii. 23.

⁸ Rhases, Divis i. 39; Contin. xxviii.

for arresting hæmorrhage. Thus it becomes apparent that the use of ligature for stopping bleeding was well known to the ancient surgeons and the present methods of arresting bleeding are only the revival of the old practice. Adams¹ concludes: "It appears, therefore, that the use of the ligature for stopping hemorrhages was well understood by the ancients, and had never been lost sight of even in the darkest ages."

¹ Adam's Commentary on Paul, vol. II. p. 132.

CHAPTER VI.

THE ŚĀSTRA OR THE SHARP INSTRUMENTS.

1. THE MAṆDALĀGRA OR ROUND HEADED KNIFE.

It is described as a round or circular headed cutting instrument, having a length of six aṅguli. Two sub-varieties are noted—one with a circular edge and the other shaped like a razor (Dallaṇa).¹ Vāgbhaṭa², however, describes the blade to be shaped like the index finger when its nail points towards the palm of the hand. This would then resemble the decapitating hook of Ramsbotham.

It is said to have been principally used for the operation of cutting through and scraping³; so it is recommended to be used

¹ मण्डलमिवायं यस्य तत् मण्डलायं तच्च द्विविधम् तथाहि—

यदये मण्डलं कृतं चुर संस्थानमेव वा ।

मण्डलायस्य जानीयात् प्रमाणानु षडङ्गुलम् ।

Nivandha Saṁgraha, viii.

² मण्डलायं फले तेषां तर्जन्यन्तर्नखाकृति ।

लेखने केदने योज्यं पोथिकी शुष्किकरदिषु ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

मण्डलायं, मण्डलायं नाम शस्त्रं, फले, फल प्रदेशे, तर्जन्यन्तर्नखाकृति स्यात्, अन्तः, अन्तर्हितो नखः, अन्तर्नखः, तर्जन्या अन्तर्नखः तर्जन्यन्तर्नखः, तस्मैवाकृति राकारो यस्य तत् तर्जन्यन्तर्नखाकृति । तच्च पोथिकी गलपुष्पिकादिषु, लेखने, लेखन कर्मणि, तथा केदने, केदन कर्मणि, योज्यं ।

Vāgbhaṭārtha Kaumudī, I. xxvi.

फलोद्देशे तर्जन्या अन्तर्नखस्तर्जन्यन्तर्नखस्तस्मैवाकृतिर्यस्य तदेवम् ।

Sarvāṅga Sundarī, I. xxvi.

³ तत्र मण्डलायकरपत्रे स्यातां केदने लेखने च ।

Sūśruta Saṁhitā, I. viii.

in the operative treatment of enlarged tonsil¹. It is also advised to be used for piercing the skull of a dead foetus in utero to help its easy extraction by other instruments. So any other presenting part causing difficulty in the delivery of the dead foetus, is to be cut with it. It is claimed that there is less likelihood of damaging the soft parts of the mother by this instrument than by the sharp pointed *vrddhipatra*.²

We find that *Suśruta* recommends a *mandalāgra* knife in ophthalmic practice for scraping away the membranous expansion in the operation of *pterygium*³ and other ophthalmic operations,

¹ अङ्गुष्ठाङ्गुलिसन्दंशेनाकृष्य गलगण्डिका ।

क्षेदेन्मण्डलाग्रं य जिह्वोपरि तु संस्थिताम् ।

नोत्कृष्टश्चेव ह्रीनश्च विभागं क्षेदेयेद्विषक् ॥

Suśruta Samhitā, IV. xxii.

² तच्च स्त्रियमाश्वास्य मण्डलाग्रं शङ्खली शस्त्रेण वा शिरो विदार्य शिरःकपालान्वाह्य शङ्खना गृहीत्वोरसि कचायां व्यपहरदभिन्नेशिरसि चाचिफूटे गण्डे वा असंसक्तस्यांसदेशे वाङ्गं क्षिला दृढतिमिवातलं वातपूर्णोदरं वा विदार्य निरस्थान्वापि शिथिलीभूत माहरेज्जघनसक्तस्य वा जघनकपालानीति ।

यद्, यदङ्गं हि गर्भस्य तस्य स्वजति तद्विषक् ।

सम्यग्विनिर्हरेच्छिला रक्षेत्रासीत् यन्नतः ।

गर्भस्य गतयश्चिन्ना जायन्तेऽनिलकोपतः ।

तच्चानात्ममतिर्व्यो वर्त्तते विधिपूर्वकं ॥

नोपेक्षेत स्रुतं गर्भं मृदुत्वं नपि पण्डितः ।

सञ्ज्ञाय जननीं हन्ति निरुच्छासं पशुं यथा ॥

मण्डलाग्रं य कर्त्तव्यं क्षेद्यमन्तर्विजानता ।

उद्धिपत्रं हि लोचाग्रं नारीं हिंस्रात् कदाचन ।

Ibid, IV. xv.

³ अर्थं यत् वलीजालं तत्रैतद्गगयेद भिषक् ॥

अपाङ्गं प्रेक्षमाणस्य वङ्गिणेन समाहितः ।

सुषुप्ताग्रेण मेधावी सूचीद्वयेण वा पुनः ॥

नचोत्थाप्यता क्षिप्रं कार्यमभ्युन्नतं तु तत् ।

such as for vascular net-work and nodules on the eyeball¹. Cakradatta says² that if the pterygium extends to the black part of the eye, the membrane is to be raised by the point of a needle, transfixed by a vaḍiśa or hook, and leaving the pupil free, is to be excised, as Sivadāsa³ explains, by the maṇḍalāgra. He also uses it to scrape away the root of any new growth in the eye⁴ and to perform the operation of scratching in ophthalmic surgery⁵.

शस्त्रपातभयाश्चास्य वक्ष नी शङ्खयेद् दृढं ॥

ततः प्रशिशिलीभूतं त्रिभिरेव विलम्बितं ॥

उल्लिखन्मण्डलायेणः तीक्ष्णेन परिशोधयेत् ॥

विमुक्तं सर्वतश्चापि कृष्णाच्छुक्ताञ्च मण्डलात् ॥

नीत्वा कनीनकोपान्तं क्षिन्द्याद्वाति कनीनकं ॥

चक्षुर्भागस्थिते मांसे नास्ति व्यपत्तिमहति ॥

Suśruta Saṁhitā, VI. xv.

¹ सिराजाले सिरायास्तु कठिनाश्चाश्च दुहिमान् ॥

उल्लिखन्मण्डलायेण वङ्गिणेनावलम्बितः ॥

सिरासु पिङ्काजाता या न सिध्यन्ति मेषजैः ॥

अश्ववन्मण्डलायेण तासाञ्छेदनमिष्यते ॥

Ibid.

² अश्वं तु छेदनीयं स्यात् कृष्णप्राप्तं भवेद्दृढदा ।

वङ्गिश्विङ्गसुन्नस्य विभागश्चात्र वर्जयेत् ॥

Cakradatta, Netraroga Cikitsā.

³ अश्वच्छेदनीयमिति मण्डलायेणेति शेषः । समुन्नयेति सूचयेणेति शेषः । सूचयेण समुन्नस्य उत्तोल्य अनन्तरं वङ्गिणेन विद्धा मण्डलायेण छेदयेदित्यर्थः ।

Tattva Candrikā, Netraroga Cikitsā.

⁴ अश्वस्ताथावत् नान्दा शृङ्गाशोऽर्धदूमेव च ।

मण्डलायेण तीक्ष्णेण मूलेच्छिन्द्याद् भिषक् शनैः ॥

Cakradatta, Netraroga Cikitsā.

⁵ भिल्लीपनाहं कफजं पिप्पली मधूसैन्धवैः ।

विलिखन्मण्डलायेण प्रच्छेद्यद्वा समन्ततः ॥

* * * *

A small instrument with a broad blade and a rounded cutting tip is figured by Albucasis¹ in connection with ophthalmic work. This was the scalpel for the plastic operation on the eyelid as for trichiasis. Incisions were made by this knife on the eyelids in such a way as to enclose a leaf-shaped area which was then dissected off. The lips of the incisions were then united with three or four sutures². Paul³, quoting Aetius⁴, describes the operation for pterygia :—"Having separated the eyelids, and seized upon the pterygia with a hook-like instrument, having a small curvature, we stretch it, and taking a needle having a horse-hair and a strong flaxen thread in its ear (eye?), and a little bent at the extremity, we transfix it through the middle of the pterygium, and with the thread we bind the pterygium and raise it upwards, while with the hair we separate and saw as it were the part at the pupil away unto its extremity ; but the remainder of it at the great canthus we cut off from the base with the scalpel used for the operation by suture, but leaving the natural flesh of the canthus, lest there be a running of the eye when it is taken away. Some stretching as aforesaid with a thread, dissect away the whole pterygium with the instrument called pterygotomos, taking care not to touch the corner."

Cakradatta mentions the use of the maṇḍalāgra for scarifying

घृतसैन्धव चूर्णेन कफानाहं पुनः पुनः ।

दिलिखिन्मण्डलाग्रेण प्रच्छयेद्वा समन्ततः ॥

Cakradatta, Netraroga Cikitsā.

¹ Milne. Græco-Roman Surgical Instruments, Pl. ix. fig. 3.

² Paulus Ægineta, VI. viii.

³ Ibid, VI. xviii.

⁴ Aetius, II. iii. 60.

the tongue for bleeding in the disease called *jihvākantaka* (prickly tongue)¹. He also uses it in *adhijihvā* or *ranula* and says: "The tongue is to be raised, the *ranula* is to be drawn up and fixed by a sharp hook, and then excised by the *maṇḍalāgra*. Afterwards a strong gargle is to be prescribed".² *Pālakāpya*³ also describes it to have a length of nine *aṅguli*, the handle being six, and the blade three *aṅguli* long. The end is full-moon-shaped and it is directed to be used for scarification on the eyeball.

It seems that *maṇḍalāgra* of different sizes and shapes were used. For the instrument used for perforating the foetal cranium in uterus would scarcely be thought fit for a delicate operation on the eyeball.

Soranus⁴ mentions a special instrument for perforating the foetal head. Rhases⁵ directs us to open the head when the child's cranium is large and cannot be brought down. Haly

¹ कण्ठकेषु कफौल्लेषु लिखितेष्वसृजः क्षये ।

पिण्डादिर्मधुयुतः कार्यन्तु प्रतिसारणम् ॥

Cakradatta, Jihvārōga Cikitsā.

लिखितेष्विति मण्डलायादिना ।

Tattva Candrikā, Ibid.

² उन्नाय जिह्वामाह्वय वङ्गिमेनाधिलिङ्गिकाम् ।

हेदयेन्मण्डलायेण तौच्छोर्णैर्लवणादिभिः ॥

Cakradatta, Mukharoga Cikitsā.

³ लेखनं मण्डलाग्रेण कर्तव्यं दन्तिनां भवेत् ।

Pālakāpya, III. i.

पूर्णचन्द्राकृत्यायमण्डलायम् लेखनार्थमण्डो ।

Pālakāpya, III. iii.

⁴ Soranus, II. viii., P. 366.

⁵ Rhases, Cont. xxii.

Abbas¹ also advises us to open the head when it is preternaturally large. Aetius² also gives a similar description. Some authors recommend the polypus-scalpel or the phlebotome in embryotomy. The embryotome figured by Albucasis³ is a straight two-edged blade, and we may conjecture that the *maṇḍalāgra* used by the Hindus for perforating the fetal cranium was a similar instrument.

2. KARAPATRA OR SAW.

It literally means, "an instrument having the blade in the form of a hand", the fingers being represented by the teeth of the saw. Others explain, as Dhallapa⁴ points out, the name from its resemblance to a carpenter's saw. It seems that saws of various sizes were used. Śaśruta mentions its length to be six *añguli*, Vāgbhata⁵ describes it to be ten *añguli*

¹ Haly Abbas, Pract. ix. 57.

² Aetius, XVI. 23.

³ Greco-Roman Surgical Instruments, Pl. viii fig. 7.

* करपत्रमिति करपत्रं पत्रं करपत्रं यथा करोऽङ्गुलिभिराचितो भवति तद्वत् यत् कच्छकैराचितं ज्ञातम् करपत्रमुच्यते । अथं तु करपत्रमर्थं करपत्राकारमेव तच्च दादमाङ्गुलं तन्मानसं वचनाम् । ननु यदि तन्मानसान् दादमाङ्गुलं करपत्रमुच्यते तर्हि ज्ञातमे विरोधः कुतः ज्ञातमे करपत्रस्य निर्दिष्टप्रमाणत्वात् श्रवणिं तु वक्रङ्गुलानि इत्यनेन वाक्येन वक्राङ्गुलमेव करपत्रम् ज्ञातं दादमाङ्गुलं नैवम् तेषाम् मासाभिरंवाहृतयः प्रायेण व्याख्याता इत्येकात् सूत्रात् प्रायः शब्दोऽनुवर्ततेतेनायमर्थः श्रवणिं प्रायेण वक्रङ्गुलानि एवं वक्रमाणिऽन्वयाच्चविरोधः ।

Nivandha Sathgriha, I. viii.

* छिदीऽप्यां करपत्रम् करधारं दमाङ्गुलं ।

विचारि दाङ्गुलं सूक्ष्मत्वं ज्ञातुं च यत्नम् ॥

Aṣṭāṅgā Hṛdaya Saṁhitā, I. xxvi.

करपत्राकारं याज्जमाह छिदी इत्यादि करपत्रं पत्रं यथा तत् करपत्रं, अङ्गुलिभिराचितो यथाकारो भवति तद्वत् यत् कच्छकैराचितं तत् करपत्रमुच्यते । करपत्रं ज्ञातम् । करपत्रं करधारं, करः, तीक्षा, चारा यथा तन्वाचिकम्, तथा दमाङ्गुलम्,

long and two aṅguli broad; while Bhoja¹ alludes to a saw, twelve aṅguli long. The edge of the instrument is described as rough and serrated; and this is the only instrument that need not have a very sharp edge.

The handle of the saw should be well formed and pegged. Its principal use is to saw a bone. Sometime it is recommended for the purpose of scraping.

Saw is frequently mentioned by the Greek and Roman authors in the descriptions of operations on the bones. Celsus² mentions it in describing the amputation of a gangrenous limb. With reference to fractures of the bones of the head, Paul says³: "But the mode of operating with saws and the instrument called chœnicides or modioli (trepan?) is condemned by the moderns as a bad one." Evidently he means flat cranial saws. Galen⁴ also mentions the "knife-shaped saws."

In modern times the saw is still used for identical purposes in surgery.

There is no mention of trephine in Hindu surgery though Jīvaka (500 B.C.) is said to have practised cranial surgery with success⁵. Pandit Vallala describes⁶, in his Bhojaprabandha or

दैर्घ्येन दशाङ्गुल परिमाणं, तथा विस्तारे द्वाङ्गुलं, परिसरे अङ्गुलद्वयपरिमितं तथा सूक्ष्म दन्तं सूक्ष्मा दन्ताकारा दन्त यस्य तत्तथाविधं, तथा स्वतुस्रवन्धनं, तस्य खड्गं मुष्टिः वन्धनं, कीलादिना वन्धनं, तुस्रश्च वन्धनश्च ते तस्य वन्धने, शोभने तुस्र वन्धने यस्य तत्तथाविधं । तच्च अद्वयं हेदे, हेदेन कर्म्मणि योज्यं ।

Vāgbhaṭārtha Kaumudī, I. xxvi.

¹ See foot-note 4, P. 230.

² Celsus, VII. xxxiii.

³ Paul, VI. xc.

⁴ Galen, XVIII. 331.

⁵ See Mahāvāgga, VIII. 1.18. Sacred Books of the East. Vol. xvii.

⁶ See foot-note 1, p. 60.

Anecdotes of King Bhoja, a surgical operation performed on the king. He was suffering from a severe pain in the head. Medicines did him no good, and so to give relief, surgical interference was thought necessary by two brother surgeons who happened to arrive in Dhar at that time. They are said to have administered a drug called sammohinī to render him insensible. They then trepanned the skull and removed the real cause of his complaint. They closed the opening, stitched the wound and applied a healing balm. They are then said to have administered to the king another drug called sañjibanī to accelerate the return of consciousness.

Trephine was well known to the ancient Greeks and Romans. Hippocrates¹ mentions a trephine or a saw having a circular motion, in the treatment of injuries to the head. Paul also mentions trephine, the use of which is, he says, condemned by the moderns. Sprengel² remarks, that "Galen was averse to the use of the trepan, though he performed the operation on the head occasionally."³

3. VRDDHIPATRA.

This sharp cutting instrument is called vṛddhipatra from its resemblance to the leaf of a medicinal plant called vṛddhi. Two varieties of this knife are described by Vāgbhaṭa⁴—one is

¹ Hippocrates, III, 371, 374.

² Hist. de la Méd., 18.

³ Adam's Commentary on Paul, VI, xc. Vol. ii., p. 436.

⁴ वृद्धिपत्रं चुराकारं छेद मेदन पाटने ।

चञ्चलमुच्यते शोफ गन्धरी तु तदन्यथा ।

नतायं पृष्ठतो दीर्घं ऋस्ववक्त्रं यथायथं ॥

straight throughout and it is to be used for opening pointed superficial abscesses; and the other has the end bent or curved. Again amongst the second class of curved knives, some have their ends long and therefore called *dirgha-vaktra* or long-mouthed, and these are to be used for opening the deep seated abscesses, while others have their ends short and therefore called *hrasva-vaktra* or short-mouthed, and these are to be used for superficial abscesses that would not point. *Suśruta* describes them to be six *aṅguli* long. *Dallaṇa* in his commentary¹ says:—Both the varieties, one with a curved,—and this is called a *kṣura* or razor,—and the other with a resected point, should be seven *aṅguli* long; the handles and the blades should measure five and a half and one and a half *aṅguli* respectively.” These are to be used for cutting through a part, partially or completely, and also for puncturing it.

वृद्धिपवाद्यां शस्त्रमाह वृद्धिपवमित्यादि वृद्धिपवं नाम शस्त्रं, चुराकारं, चुराकृतिः, चुरश्च लोमच्छेदकः शस्त्रविशेषो नरमुन्दराणां । तच्च वृद्धिनामीषध वृक्षस्य पत्रसदृश फलकत्वात् वृद्धिपवाद्यां लभते । तद् वृद्धिपवं नाम शस्त्रं केदे मेदने पाटने च कर्मणि योज्यमिति ऋज्वयमित्यादिना विषय विशेषे वृद्धि पवस्याकार मेद उच्यते । यत् वृद्धिपचं ऋज्वयं सरलायभागं, आयतायमित्यर्थः । तत्, उन्नते, उच्छित्ते, शोके, शोथे, योज्यं । गम्भीरे, मेद आदि धातुस्थे शोफे, तथा तदन्यथा, अनुन्नते च शोफे, यत् वृष्टतः, पृष्ठदेशे नतायं वक्षीभूतायभागं, कुक्षितायमित्यर्थः । तत् वृद्धिपचं शस्त्रं यथायथं दीर्घं ऋक्ष वक्त्रं, दीर्घं मुखं, ऋक्ष मुखं वा योज्यं । यथायथमिति गम्भीरे शोके दीर्घवक्त्रं, अनुन्नते च शोके ऋक्षवक्त्रमित्यर्थः । अत्र द्विविधं वृद्धिपव शस्त्रयुक्तम्, हे अपि सप्ताङ्गुल प्रमाणे, हयोरपि अर्धपञ्चाङ्गुलं हन्तं कार्यं सार्द्धाङ्गुलद्वयं फलमिति । मेदनः, मेदं, एकस्मिन् शरीरदेशे शस्त्रमावगाह्य अपर दिशा शस्त्रायस्य निष्काशनं मेदनं । पाटनं, विदारणं फाड़न इति लोकी ।

Vāgbhaṭārtha Kaumudī, I. xxvi.

¹ वृद्धिपवमिति, वृद्धेः पचमिव वृद्धिपवं तच्च द्विविधं एकं अक्षितारं, द्वितीयं प्रयतारं, हे अपि सप्ताङ्गुल प्रमाणे हयोरपि अर्ध पञ्चाङ्गुलं हन्तं कार्यं सार्द्धाङ्गुलम् फलम् इति अनयोर्कथ्ये अक्षितारं वृद्धिपवं चुरमाहः ।

Nivandha Saṁgraha, I. viii.

One form of the *vṛddhipatra* resembles in shape the razor used by the barbers,—not the English razor that has now become common in Bengal, but the country-made razors which are still used by the barbers in the North-West Provinces.

Suśruta recommends the use of razor, scissors and pinchers for shaving the parts before operation; for “the hairs”, he says, “prevent the healing up of the wound rapidly”¹. He again uses *vṛddhipatra* as a knife and observes:—“If bitten by spiders whose bites are amenable to treatment, the area of the wound should at once be excised out by the *vṛddhipatra*, and then actual cautery applied by the red-hot *jāmvaṇṇa* probe till the patient requests for its withdrawal”².

Suśruta uses the *vṛddhipatra* knife for the removal of the scrotal tumour and says³: “The scrotal tumour is to be well fomented and bandaged. The patient should then be cheered up, and leaving the testicles intact, underneath the median raphe, the tumour should be excised by *vṛddhipatra* knife. The fatty tissues being

¹ रोमाकौशौ ब्रणो यस्तु न संम्यगुपरोक्षति ।

क्षुरकर्तरीसन्दर्शे सप्तारोमाणि निर्हरेत् ॥

Suśruta Saṁhitā, IV. i.

² साध्याभिराभिलुताभिर्दष्टमावस्य देहिनिः ।

हस्तिपक्षेण मतिमान् सम्यगादंशमुद्धरेत् ॥

जाम्बवेनापि तमेन दहेदाकारं वारणात् ।

Ibid, V. viii.

³ सिन्नां चावेष्टा पट्टेन समाश्वासात् मानवं ।

रक्षेत् फले सेवनीञ्च हस्तिपक्षेण दारयेत् ॥

मेदस्ततः समुद्धृत्य दद्यात् कासीससैन्धवे ।

बन्नीयाञ्च यथोद्दिष्टं ।

Ibid, IV. xix

removed, powdered ferri sulphas and rock salt are to be dusted over the wound and proper bandages applied.”

Vṛddhipatra was also used by the ancient veterinary surgeons. Joyadatta Suri writes¹: “The knife known as vṛddhipatra is shaped like a kṣura or razor. It is three aṅguli long and should be used by the wise to incise a suppurated abscess”. In Pālakāpya², we find that “it is ten aṅguli long; the handle being six aṅguli and the blade four aṅguli long and three aṅguli broad. It is used for scission and excision”. He uses it also in opening a sinus after well ascertaining its course by means of a probe³.

Hypodermic medication:—The use of hypodermic syringe was not known to the Hindus. They were acquainted however with the hypodermic method of exhibition of drugs. Śārṅgadharā⁴

¹ वाङ्मूलं वृद्धिपत्रञ्च चूराकारं प्रकीर्तितम् ।

पक्षयोथादिषु प्राज्ञः पाटनं तेन कारयेत् ॥

Āśvavaidyaka, XIV. v. 22.

² शस्त्रेण वृद्धिपत्रेण वासि(शि)तेन सि(शि)तेन वा ।

शस्त्रकर्त्रेण निष्पातः सुपक्वं पाटयेद्विषक ॥

Pālakāpya, III. iv.

वृद्धिपत्रेण नागानां कुर्याच्छेदनं मेदने ।

Pālakāpya, III. i.

³ अथ भिषगयन्त्राधायोक्तेन विधिना सुयन्त्रितं वारणमभिविश्वास्याऽऽश्रित्य स्तम्भानुगतं गतिमन्तं स्वल्पमुखं नाडीव्रणमेषणया च विदित्वा वृद्धिपत्रेण शस्त्रेणानुलोमं पूयप्रति, रणार्थ-च्छेदं कुर्यात् ॥

Pālakāpya, III. xv.

⁴ प्रचयि वा चूरेणाङ्गं केवलानिलपौडितम् ।

तत्र प्रदेष्टुं दद्याच्च पिष्टं गुञ्जाफलैः कृतम् ॥

तेनाववाहुजा पौडा विपक्षी गृह्णसी तथा ।

अन्यापि वातजापौडा प्रशमं याति वेगतः ॥

Śārṅgadharā Saṅgraha, III. xi.

directs us to scarify a part with a razor and then apply an ointment of guñjā (*Abrus precatorius*) in sciatica, scrofulous glands of the neck, etc. For treating a person in the state of unconsciousness caused by the derangement of all the humours, he directs us to scarify the anterior fontanelle with a razor, then to apply as much medicine as can be carried on the point of a needle to the part and rub it with fingers¹. The medicine is to be prepared thus:—take aconite 1 pala, quicksilver 1 śāna; mix, and put inside two sorābas or earthen basins smeared with powdered glass and placed face to face. Apply some external application over this and put it on fire for six hours. Then open the basins, take the soot collected on the upper basin and deposit it in a glass vessel quickly to prevent exposure. Caraka² also advises us to apply a medicinal paste on a cranial incision, shaped like

विषं पलमितं सूतः शणिकश्चर्णयेद्द्वयम् ।
 तच्चूर्णं सम्पूटे च कृत्वा काष्ठलितसरावयोः ॥
 मुद्रां दत्त्वा च संशोष्य ततश्चुङ्गां निवेशयेत् ।
 वर्लिं शनैः शनैः कुर्यात् प्रहरद्वयं संख्यया ॥
 तत उत्पाद्य तन्मुद्रासुपरिस्थे सरावके ।
 संलग्नो यो भवेद्भूमः तं गृह्णीयाच्छनैः शनैः ॥
 वायुस्पर्शी यथा नस्रात् ततः कुर्यात् निवेशयेत् ।
 रसः सूचीमुखेलग्रस्त्रूप्या निर्याति भेषजम् ॥
 तावन्मात्रो रसो देयो सूच्छिंते सन्निपातिनि ।
 क्षुरेण प्रक्षिते सूच्छिंते तदङ्गुल्या च चर्षयेत् ॥
 रक्तं भेषजं सम्यक्ान्मुच्छिंतोऽपि हि जीवति ।
 तथैव सर्पदंष्ट्रस्तु सतावस्थोऽपि जीवति ।
 यदातापो भवेत् तस्य सधुरं तत्र दीयते ॥

Sārāgadhara Saṁgraha, II. xii.

- ¹ विषद्रुषितं कफमारुहः क्षीतसंरीधरुङ्गवायुश्च ।
 सतश्च यस्मिन्मर्षः स्यादसाध्यलिङ्गे विहीनश्च ॥

the foot of a crow, in case of snake-bite when he becomes unconscious but his life is not completely despaired of.

4. NAKHA ŚĀSTRĀ OR NAIL PARER.

Suśruta¹ mentions its length to be eight aṅguli. Dallana² says that its blade is two aṅguli long and one aṅguli broad. Vāgbhaṭa³, on the other hand, describes the length to be nine aṅguli. Arunadatta⁴ thinks it to be a double instrument, one end having a straight edge and the other an oblique one. Some explain⁵ that two different kinds of nakha śāstra—one with a straight and the other with an oblique edge—are directed to be used.

चर्मकषायाः कल्मस्विलसमं सृष्टिं काकपदमस्य ।

हत्वा कुर्यात् कटमौ कटुकोटफला प्रथमनश्च ॥

Caraka Saṁhitā, VI. xxv.

¹ तव नखशस्त्रेष्वावष्टाङ्गुले सूच्योवत्यन्ते ।

Suśruta Saṁhitā, I. viii.

² नखशस्त्रमिति नखानां छिदनाय शस्त्रं नखशस्त्रं तस्य फलं द्वाङ्गुलायामम् एकाङ्गुलं विस्तृतम् ।

Nivandha Saṁgraha, I. viii.

³ वक्रजुंधारं द्विसुखं नखशस्त्रं नवाङ्गुलं ।

सूक्ष्मशल्योद्भूतिच्छिद्रेदं प्रच्छानं लिखने ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

⁴ नखशस्त्रं नखच्छेदकं प्रसिद्धं । तस्य वक्रा ऋजुधारा यस्य तदेवम् । तस्यैकं सुखं वक्रमन्यद्वज्जु स्पष्टम् ।

Sarvāṅgasundarī, I. xxvi.

⁵ नखशस्त्रमाह वक्रजुंधारमित्यादि नखानां छिदनाय शस्त्रं नखशस्त्रं तत् द्विसुखं द्वि विः प्रकारं सुखं यस्य तद्विसुखं तथा वक्रजुंधारं एकं वक्रं धारं अपरम् ऋजुधारां स्यात्, तथा नवाङ्गुलं सभयोमपि दैर्घ्येण नवाङ्गुलपरिमितं तस्य नखशस्त्रं शल्योद्भूत्यादौ योज्यं शल्यानां कण्टकदीनामुद्भूति रुद्धरणं शल्योद्भूतिः प्रच्छानं चरा इति यस्य प्रसिद्धिः लिखनं चाञ्चन् इति लोके ।

Vāgbhaṭārtha Kaumudī, I. xxvi.

They are principally recommended for cutting, puncturing and scarifying¹; and also for the extraction of needles and minute foreign bodies from the soft parts.

There is no mention of a many-bladed scarificator in the surgical books of the Hindus, but its office was performed by the *nakha śāstra*, in wet cupping, by making parallel incisions close to one another.

Paul² alludes to an instrument compounded of three blades joined in such a way that at one stroke, three scarifications were made; but he prefers a single scalpel for the purpose.

Pālakāpya mentions an instrument called *rampaka*³, having the handle ten *aṅguli* and the blade three *aṅguli* long. It is to be used for paring the nails and cleaning the feet of the elephants.

5. MUDRIKĀ.

It is described to be a cutting instrument of the size of the last phalanx of the index finger⁴; it is also called *aṅguli-śāstra* or finger-knife. *Vāgbhaṭa* describes this instrument but not clearly. He says that the mouth of the *aṅguli-śāstra* looks as if coming out of a ring, and the blade is half an *aṅguli* wide. A ring, having the size sufficient to admit the terminal phalanx of the index

¹ हस्तिपदं नखशस्त्रं सुद्रिकोपलपदकाश्च धारानि ह्येदने भेदने ।

Suśruta Samhitā, I. viii.

² Paulus Ægineta, VI. xli.

³ रम्पकास्त्राङ्गुलमुखी दशाङ्गुलवच पादशोधनार्थं नखच्छेदनार्थं चेति ।

Pālakāpya, III, xxx.

⁴ प्रदेशिन्यपपर्वप्रदेशप्रमाणासुद्रिका ।

Suśrutā Samhitā, I. viii.

finger, should be soldered to it. The base of the instrument has a thread tied to it¹.

It is recommended to be used for cutting through neoplasms in the throat. In its uses, Vāgbhaṭa says that it resembles the maṇḍalāgra and vṛdidhipatra; and so was sometimes required for perforating the skull of a dead foetus in the uterus of its mother².

Dr. Simpson of St. Andrews (1744) is said to have invented an instrument, a “ring scalpel” for opening the skull. It consists of a loop of steel, through which the finger is to be passed

1 कुर्यादङ्गुलिशस्त्रकं ।

सुद्रिकानिर्गतमुखं फलेलङ्गुलायतं ।

योगतो वृद्धिपत्रेण मण्डलाग्रेण वा समं ।

तत्प्रदेशिन्यथ पर्वप्रमाणार्पणं सुद्रिकम् ।

सूत्रवद्धं गलस्त्रोतो रोगक्षेदने भेदने ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

कुर्यादित्यादिना अङ्गुलिशस्त्रकं व्यक्ति । सुद्रिका अङ्गुरीयकेष निर्गतं निष्क्रान्तं मुखं यस्य तत्तथाविधं सुद्रिकानिर्गतमुखं तथा फले फलोद्देशे अङ्गुलायतं अङ्गुलिमात्रं विस्तारं अङ्गुलि शस्त्रकं अङ्गुलिनाम शस्त्रं कुर्यात् । तच्च योगतः प्रयोगे वृद्धिपत्रेण मण्डलाग्रेण वा समतुल्यं भवति । लेखने च्छेदने वृद्धिपत्रवत् योज्यं किम्वा क्षेदने भेदने पाटने मण्डलाग्रवत् योज्यमित्यर्थः । तदित्यादि तदङ्गुलि शस्त्रकं प्रदेशिन्यथ पर्वप्रमाणार्पणं सुद्रिकं कुर्यादिति योज्यं । वैद्यस्य प्रदेशिनी नाम्नी अङ्गुलि सप्तधा अथ यत्पर्वं तत्तथा तस्य यत् प्रमाणं परिमाणं तदर्पणा तत् प्रवेशोपयुक्ता सुद्रिका यस्य तत्तथाविधं । सुद्रिका सुदरी आङ्गुली इति वा ख्याता । तथा सूत्रवद्धं मूलदेशे सूत्रेण वद्धं तच्च गलस्त्रोतो गतानां रोगाणां क्षेदने भेदने च योज्यं ।

Vāgbhaṭārtha Kaumudī, I. xxvi.

2 विष्कम्भी नाम तौ सूद्री शस्त्रदारणमङ्कतः ।

मण्डलाङ्गुलि शस्त्राभ्यां तदकार्षं प्रशस्यते ।

वृद्धिपत्रं हि तीक्ष्णार्थं न योगाद्वचनयेत् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, II. ii.

and from which protrudes a sharp pointed blade about an inch long, by which the cranium was pierced¹.

In the pseudo-Hippocratic treatise² a knife to fix on the thumb and dismember a foetus in utero is mentioned. This knife is called by Turtullian³ the "ring knife", whereby the limbs are advised to be cut off in the womb. It is interesting to point out that *mudrikā* also means a ring.

The veterinary surgeons still use a scalpel blade mounted on a ring⁴, through which a forefinger is passed to dismember foals and calves in exactly the same way.

6. UTPALAPATRA.

This knife is described to have the shape of a petal of the blue lotus. The end is long, sharp and pointed. The *utpalapatra* is *dīrgha-vaktra* or long bladed, while the *arddhadhāra* is the *hrasva-vaktra* or short bladed knife⁵. It is to be used for cutting through and puncturing the parts.

¹ Ed. Med. Essays, vol. V, Part I, P. 445.

² Hippocrates, I. 463.

³ De Anima, 26.

⁴ Græco-Roman Surgical Instruments, Pl. vii. fig. 1.

⁵ दीर्घं ऋक्षवक्त्रं यथायथं ।

उत्पलाध्यर्धधाराख्ये भेदने हृदिने तथा ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

उत्पलपत्राख्यधर्धधाराख्ये शस्त्रे आह उत्पलित्यादि उत्पलस्य अर्धधारास्य ते आख्ये ययोः शस्त्रयोः से उत्पलाध्यर्ध धाराख्ये शस्त्रे तथा, यथाक्रमं दीर्घं ऋक्षवक्त्रे भवतः । तच्च उत्पलाख्यं दीर्घवक्त्रं, अर्धधर्धधाराख्यं ऋक्षवक्त्रमित्यर्थः । उत्पलशब्देन उत्पलपत्राख्यं शस्त्रं गम्यते तन्नाम्नरदर्शनात् । तस्य फलस्य उत्पलपत्रकारलादुत्पलपत्रमिति संज्ञितम् । अधिकमर्धं धारा यस्य तत् अर्धधर्धधारा । इत्युक्तलयोर्मध्ये फलस्यैव किञ्चिदधिकं दीर्घमिति वक्ष्यते । तच्च अष्टाङ्गुलायत्तं उरसि अङ्गुलं विस्तारं ।

Vāgbhaṭṭārtha Kaumudī, I. xxvi.

In the Aśvavaidyaka, the utpalapatra and vṛhipatra knives are recommended to be used in puncturing the veins in phlebotomy¹. "The surgeon who is practically acquainted with the methods of puncturing the veins, should use the utpalapatra and vṛhipatra knives for the purpose."

When used for puncturing the large veins the knife is recommended to be encircled with thread at a short distance from the end to prevent unnecessary injury to the vessels by plunging the the knife deeply².

Hippocrates similarly "gaards his phlebotome in the surgical treatment of empyema, by having it wound round with a rag, leaving the breadth of the thumb nail at the point."³

Both the utpalapatra and vṛhimukha knives are thus described in the Aśvavaidyaka⁴: The "vṛhimukha knife should be six aṅguli long and half an aṅguli wide. The utpalapatra should also be similarly made."

The utpalapatra knife is recommended to be used for incising

¹ शस्त्रेणोत्पलपत्रेण व्रीहिपत्रेण वा भिषक् ।

शिराविधविधिं सम्यग् दृष्टकर्मा प्रयोजयेत् ॥

Aśvavaidyaka, XIV. v. 23.

² सूत्रकेण च संवेध्य मुखं शस्त्रस्य बुद्धिमान् ।

यथाप्रमाणं संस्थाप्य ततो विस्त्रावयेत् शिराम् ॥

Ibid, XV. v. 35.

³ Hippocrates, II. 258 Kuhn's Ed. and 1. 88 Syd. Soc. Ed.

⁴ अर्द्धाङ्गुलान्तु विसीर्यं कूर्यच्छस्त्रं षडङ्गुलम् ।

नाम्ना व्रीहिमुखं सम्यक् तथा चोत्पलपत्रकम् ॥

Aśvavaidyaka, XIV. v. 21.

the abdominal parietis of the horse; then a tube is to be pushed through the wound in the operation of paracentesis abdominis¹.

The phlebotome used by the Greeks is nowhere described in their books; but from considerations of all the various operations to which the instrument was put bears out the fact of its being a sharp pointed, double-edged and straight lancet. The phlebotome of the Greeks might have then resembled in shape the utpalapatra of the Hindus. It was used by the Greeks for various operations besides phlebotomy, as for the opening of abscesses such as the parulis or gum boil², puncture of cavities containing fluid as in opening the abdomen for ascites³, incising the tunica vaginalis as in excision of hydrocele sac⁴ and for dissecting out warts⁵ and sebaceous cysts⁶.

It is interesting to note that Pālakāpya⁷ mentions utpalapatra and describes it to be eight aṅguli long, one and a half aṅguli broad and double edged. He uses it for puncturing vessels etc.

¹ हृदयसाधरे भागे ऊर्ध्वभागे च नाभितः ।

अधीवा नाभितः कूर्चच्छेदनं चतुरङ्गुलि ॥

शस्त्रेणोत्पलपत्रेण वामभागे विचक्षणः ।

एकमीवाङ्गुलं शस्त्रं कुक्षीचापि प्रवेशयेत् ॥

बोधवरी ततस्तस्मिन् नालिकां वस्त्रवेष्टिताम् ।

प्रक्षिप्य गालवेष्टारि यावद्द्विगुणलाघवम् ॥

Aśvavaidyaka, LII: vs. 25, 26 and 27.

² Paul, VI. xxvii.

³ Ibid, VI. L.

⁴ Ibid, VI. lxii.

⁵ Ibid, VI. lxxxviii.

⁶ Ibid, VI. xiv.

⁷ श्रीहिंसुरप्रमाणमुत्पलपत्रं भेदनाय ।

7. ARDDHADHĀRA.

It is difficult to ascertain the exact shape of this knife. Some translate it as a "single edged knife,"¹ but it really means, as Dallāṇa explains, an instrument which has a sharp edge for half the length². It is also called cakradhāra. Vāgbhaṭa has a variant reading—adhyārdhdadhāra—which means an instrument having a sharp edge for more than half the length³.

It is eight aṅguli long; the blade is two aṅguli long and one aṅguli wide, and the handle six aṅguli long. It is to be used for incision and division of parts of the body.

8. SŪCĪ OR NEEDLES.

Three needles are recommended to be used for applying sutures. They should be strongly made and rounded in shape. At one end they are flattened, grooved and pierced with an eye for the suture. The groove is said to have been intended to be the bed of the suture during stitching to prevent it from doing any harm to the tissue. In fleshy parts such as the thighs, a three ribbed needle, three aṅguli long, is advised to be used. For less fleshy parts and wounds about the joints, a similar straight needle but two aṅguli long should be employed, while for suturing the wounds of the stomach, intestines, serotum and the vital parts of the body, preference is given to a needle curved like a bow, two and a half aṅguli long and having the pointed end

¹ Hoernle's Translations of Suśruta Saṁhitā, Bibl. Ind. I. viii.

² अर्धधारमिति, अर्धं धारा यस्य तत् अर्धधारं, चक्रधारमिति प्रसिद्धं तच्च अष्टाङ्गुलायतं चरसि अङ्गुलं विस्तारं द्वाङ्गुलंफलं । अन्ये तदध्यर्धधारमिति पठन्ति, अधिकतमार्धं धारायस्य तत् अध्यर्धधारम् ।

Nivandha Saṁgraha, I. viii.

³ See foot-note 5, P. 240.

shaped like a paddy. In thickness, these needles are described to be equal to the stalk of the flower of mālatī (*Jasminum grandiflorum*). They should have sharp fine points and good shape¹. The needles are also recommended to be used for extraction of foreign bodies from the soft structures and also for evacuating abscesses².

¹ देशेऽल्पमांसं सन्धौ च सूचीं वृक्षाङ्गुलद्वयम् ।

आयता ब्राह्मणं चक्षा मांसले वापि पूजिता ॥

धनुर्वक्रा द्विता मर्म्भफलकोषोदरोपरि ।

इत्येतास्त्रिविधाः सूचीसीन्धायाः सुसमाहिताः ।

कारयेन्मालतीपुष्पहन्तायपरिमण्डलाः ॥

Suśruta Samhitā, I. xxv.

वृक्षागुदं दृढाः पाशे त्रिष्टः सूच्योऽथ सीवने ॥

मांसलानां प्रदेशानां वृक्षा चङ्गुलमायता ।

अल्पमांसास्थि सन्धिस्थं व्रणानां ब्राह्मणमायता ।

ब्रीहिवक्त्रा धनुर्वक्रा पक्कमाशयमर्म्भसु ।

सा साईब्राह्मणं सवर्णा वृक्षास्ताश्चतुरङ्गुला ॥

Aṣṭāṅga Hṛdaya Samhitā, I. xxvi.

त्रिष्टुपां सूचीनां विषयविशेषे आकारभेदानाह मांसलानामित्यादि 'मांसलानां' ऊर्ध्वादीनां शरीर प्रदेशानां सीवनाय सूची, 'वृक्षा' त्रिकोणविशिष्टा तथा चङ्गुलमायता, अङ्गुलचयदीर्घा कर्तव्या, अस्यास्त्रास्त्रल मयभागसैव न तु सवर्णवयवस्य । सूच्यः सर्वोऽयमस्य हि साधारणतो वृक्षा कारत्वेनिदृशादितिगम्य । अस्या अपि गुदं दृढं पाशत्वं सामान्योक्त्या कथितमेव अल्पमांसलस्थान संस्थितानां, सन्धिस्थ संस्थितानां व्रणानां सीवने ब्राह्मणमायता, अङ्गुलिद्वय दीर्घा, सूचीकर्तव्या, पक्कमाशये, आमाशये तथा 'मर्म्भसु' वक्त्रादिषु संस्थितानां व्रणानां सीवने, ब्रीहि वक्त्रा, पाटलादि ब्रीहिवक्त्रा, 'धनुर्वक्रा' धनुर्वक्राकारा या सूची साईब्राह्मणं, साईब्राह्मणाधिकं ब्राह्मणं दीर्घा योव्येति योव्यं अत्रापि गुदं दृढं पाशत्वं योजनीयं । साईब्राह्मणं सवर्णं च्छेदः । सर्व्वेत्यादि परेण सम्बध्यते ॥

Vāgbhaṭārtha Kaumudī, I. xxvi.

² सूचीकुक्ष्यपट्टाटीमुखशरीरसुखान्तर्मुखचिकूचकानि विस्वावपि ।

Suśruta Samhitā, I. viii.

In modern times, the surgeons use fully curved, half-curved and straight surgical needles. Waring¹ remarks: "The shape of the needle which ought to be used for closing an incision depends upon the depth and accessibility of the wound. In deep wounds, or wounds which are not readily accessible, curved needles will be found to be most useful, while for shallow cuts straight needles will be most convenient."

Suśruta makes mention of a javamukhī needle² (*lit.* having the sharp end shaped like a barley corn) for passing a double ligature smeared with escharotic ointment, across the base of a tumour in opposite directions. Then by cutting through the nooses, and tying together the contiguous ends of the ligatures, the whole of the growth is encircled and strangled by them, exactly in the same way as in modern times a nævus is ligatured by means of a nævus needle. Cakradatta also quotes this description of the method of extirpating tumours by ligatures.

Erichsen says³: "When the tumour is small, an ordinary double ligature may be passed across its base, by means of a common suture needle; and the noose being cut and the thread tied on each side, strangulation will be effected. When it is of larger size, and of round shape, the most convenient method is that recommended by Liston. It consists in passing, by means

¹ Manual of Operative Surgery. By H. J. Waring, M.S., M.B., Third edition, P. 42.

² अर्बुदादिषु चीतृक्षिप्यं सूले सूत्रं निधापयेत् ।

सूचीभिर्यववक्त्राभिराचितं वा समन्ततः ।

सूले सूत्रेण वस्त्रेयाच्छिन्नं चीपचरद्वयम् ॥

Suśruta Saṁhitā, IV. xvii.

Cakradatta, Nāḍivraṇacikitsā.

³ Erichsen's Surgery, Vol. II, P. 73.

of long nævus needles, fixed in wooden handles, and having their eyes near their points, double whipcord ligatures in opposite directions beneath the tumour; then cutting through the nooses, and tying together the contiguous ends of the ligatures until the whole of the growth is encircled and strangled by them."

There are many instances of the use of surgical needle by the Greek and Roman Surgeons. Needles of different sizes are recommended. Celsus mentions a large needle in describing the operation of suturing the abdominal parietis¹, and another, evidently a small needle, which is said to have been used in the treatment of staphyloma of the cornea². The needles were either round or three-cornered. "A few three-cornered needles of Roman origin have been found, although they are rare" (Milne³). Paul uses a needle in suture of the upper eyelid, and other modes of operating for trichiasis⁴, for the repair of wounds of the peritoneum⁵, and recommends a large sized needle containing a double thread to close the peritoneum in the operation for enterocele⁶.

Pālakāpya mentions sūcī or needles for stitching wounds⁷. They are eight aṅguli long, shaped like the tusk of an elephant and are either three ribbed, or four ribbed, or round, smooth and

¹ Celsus, VIII, xvi.

² Ibid, VII. vii.

³ Græco-Roman Surgical Instruments, P. 75.

⁴ Paulus Ægineita, VI. viii.

⁵ Ibid, VI. lii.

⁶ Ibid, VI. lxxv.

⁷ सूची सेवनाय । अष्टाङ्गुलं नागदन्ताकृति । चाक्षा चतुरक्षा वा दृढा समाहिता यथा शलाका वने वस्त्रविध्वंस्यम् ।

strong. He reserves curved three-cornered needles for fleshy parts and round needles for skin, veins, nerves and arteries¹.

Caraka recommends the use of leeches, knife and needles for extracting blood from the piles². He also advises us to use needles for pricking the patches of leprous spots³ before the application of leeches for extracting blood.

9. KUŚĀPATRA.

It is a form of knife resembling in shape the leaf of a kuśa grass (*Poa cynosuroides*)⁴. The instrument should be six aṅguli long (Suśruta); the blade measuring two aṅguli (Vāgbhaṭa)⁵

- १ याः सूक्ष्मस्त्रिविधाः प्रोक्ताः शस्त्राध्याये संस्थिताः ।
नागदन्ताकृतिर्हृत्ता विकोणा चेति निश्चयात् ॥
अस्थ्याश्रितं नागदन्तया मांसजं च विकोणया ।
त्वक्क्षयाय धमनीस्थं च शिराजं चैव वृत्तया ।
आहार्यं सर्व्वयन्त्राणां सूत्रा जीवनमिष्यते ॥

Pālakāpya, III. 12

- २ जलौकोमिः तथा शस्त्रैः सूचीभिर्वा पुनः पुनः ।
अवर्त्तमानं रुधिरं रक्ताशैथिल्यं प्रवाहयेत् ॥

Caraka Saṁhitā, VI. ix.

- ३ प्रच्छिन्नमल्यं कुष्ठं विरेचयेद्वा जलौकामिः ।

Ibid, VI. vii.

- ४ कुशपत्रमिति, कुशपत्रतुल्यं कुशपत्रं तन्मानमाहः—

अङ्गुलैरुचकं विद्यादङ्गुलं फलमुच्यते ।
हन्तं स्यात् त्र्यङ्गुलं मध्ये कुशपत्रस्य लक्षणम् ॥

Nivandha Saṁgraha, I. viii.

- ५ कुशाटी वदने शब्दे त्र्यङ्गुलं स्यात्तयोः फलं ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

कुशाटीवदने हे शस्त्रे, शब्दे विज्ञापणं विषये योज्ये । तयोः कुशाटी वदनयोः
फलं त्र्यङ्गुलं, अङ्गुलद्वयं परिमितं स्यात् ।

Vāgbhaṭārtha Kaumudī, I. xxvi.

and the handle four aṅguli, but according to Bhoja, the handle is three aṅguli long. It is to be used for draining pus from abscess. The handle has a ring like ornamentation, about one aṅguli in diameter. Another variant reading describes the blade, the ring, and the handle to have the lengths of two, three, and two aṅguli respectively. This would make the total length of the instrument to be seven aṅguli; so evidently there is some lapsus calami in the second reading.

Cakradatta uses kuśapatra as a bleeding lancet and says¹: "Out of the twelve vessels that lie on the sides and underneath the tongue, select the two large bluish vessels on either sides of the tongue, raise them up by vaḍiśa or hook and puncture them by the kuśapatra knife and then, after bleeding, apply a paste of treacle and ginger to the wound". In the Yogaratnākara², the author advises us to adopt this method of bleeding, in the treatment of tumours in the neck.

³ Pālakāpya mentions kuśapatra and describes it as being shaped like a kuśa grass³. It is nine aṅguli long—the handle being

¹ जिह्वायाः पार्श्वतोऽपस्रां शिरा द्वादश कौर्त्तिताः ।

तासां स्थूलशिरा कृण्वे विध्यात् ते तु शनेः शनैः ॥

वडिशेषेव संगृह्य कुशपत्रेण बुद्धिमान् ॥

Cakradatta, Galaganda Oikitsā.

² जिह्वाधः पार्श्वयोर्मूलाच्छिरा द्वादश कौर्त्तिताः ।

तासां स्थूले शिरा इ च क्खिन्द्यात्ते च शनेः शनैः ।

वडिशेषेव संगृह्य कुशपत्रेण बुद्धिमान् ।

सुते रक्ते ब्रूये तस्मिन् दद्यात्स गुडमाद्रकम् ॥

Yogaratanākara, P. 321.

³ नवाङ्गुलं कुशपत्रं । पञ्चाङ्गुलं वृत्तं । चतुरङ्गुलम् पत्रं । अध्वार्धाङ्गुलविक्षृत-
मुभयतो धारं । कुशपत्राकृति गन्धौरपाकमेदनार्थं षड्ङ्गुलं वृत्तम् अध्वार्धाङ्गुलं पत्रं ।

Pālakāpya, III. xxx.

five or six aṅguli and the blade four aṅguli long. The blade is one and a half aṅguli wide and is sharp-edged on both sides (*i.e.*, double-edged). It is used for incising deep abscesses.

10. ĀṬĪMUKHA.

This instrument is described to have the shape like the beak of the jalavardhanī bird or āṭī¹ (*Turdus ginginiamus*),—a bird living in the marshes. It is six aṅguli long; the blade measuring two and the handle four aṅguli. So it is of the same size as the kuśāpatra to which it also resembles in function. Bhoja is of opinion that its blade is one and the handle seven aṅguli long.

11. ŚARĪRĪMUKHA.

This instrument is a pair of scissors resembling the face of the long beaked bird called śarārī. Dallāṇa describes two varieties of the bird, one with white shoulders, and the other with a red head. It is the former kind which is referred to here². Suśrūta describes its length to be ten aṅguli³, while Dallāṇa mentions the length to be twelve aṅguli.

¹ आटीमुखमिति, आटी जलवर्धनी नाम पक्षिविशेषः तन्मुखवन्मुखं यस्य तत् आटीमुखं तथाचोक्तं :—

ब्रह्मं सप्ताङ्गुलं विद्यात् तस्यायं फलमिष्यते ।

आटीमुखं प्रकारं हि फलमङ्गुष्ठमायतम् ।

Nivandha Saṁgraha, I. viii.

² शरारीमुखमिति, दीर्घवच्चुः पक्षिविशेषः स द्विविधः धवलकान्तः रक्तशीर्षश्च धवलकान्तस्य शरारीति संज्ञा तन्मुखवन्मुखं तस्या शस्त्रस्य लोके कर्त्तरीति संज्ञा ताच्च द्वादशाङ्गुलां चलत्यलासां कुर्यात् ।

Ibid.

³ दशाङ्गुला शरारीमुखी सा कर्त्तरीति कथ्यते ।

Suśrūta Saṁhitā, I. viii.

It is recommended to be used for evacuating abscess¹, etc. Suśruta mentions karttari as a synonym but Vāgbhaṭa counts it as a separate instrument. He describes karttari as a pair of scissors used by the barbers for clipping hair and is said to have been necessary for dividing the nerves, ligaments and fine hairs².

12. ANTARMUKHA.

Suśruta describes another variety of scissors, used principally for evacuating abscesses. It is so named, for its straight cutting edges are within its curved claws³. It is said to be six aṅguli long and one and a half aṅguli broad⁴. It seems that the curvature of the blade varied widely; and Vāgbhaṭa describes a variety called

¹ स्नायु शरार्थास्य विकूर्चिके ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

स्नायु विस्त्रावनविषये कर्चणि शरार्थास्या विकूर्चिके द्वे शस्त्रे योज्यः । तत्र शरार्थास्य शरारीमुखं शरारी दीर्घचक्षुः पक्षिविशेषः तस्य मुखवदास्यं यस्य तत् शरार्थासां, तच्च चलत्फलं दशाङ्गुलं दीर्घं कार्यम् ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

² स्नायु सूक्ष्म कचच्छेदे कर्तरी कर्तरीनिभा ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

कर्तरीशस्त्रमाह स्नायुत्यादि कर्तरीनामशस्त्रं कर्तरीसदृशं तच्च स्नायुच्छेदने सूक्ष्मकचच्छेदने च योज्यं । कर्तरी काटारी इति यस्य प्रसिद्धिः ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

³ अन्तर्मुखमिति मध्यमुखं तल्लक्षणमाह—

अष्टाङ्गुलप्रमाणेन जिह्मवारिण चायुतम् ।

शस्त्रमन्तर्मुखं नाम चन्द्रार्द्ध इव चोद्भूतम् ।

Nivandha Saṁgraha, I. viii.

⁴ तद्वदन्तर्मुखं तस्य फलमध्यर्द्धमङ्गुलम् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

arddhacandrānan¹ or “half-moon faced” scissors in which the blades are curved like the half-moon. It has the length of eight aṅguli, the blade measuring one and a half aṅguli. This is also to be used for letting out pus from abscesses.

Hārīta, however, mentions a śāstra, called also arddhacandra or half-moon, but he recommends its use for excising the prolapsed arms of a dead foetus to effect its delivery². This instrument can not but be a knife, for it seems difficult to cut off the arm, even of a foetus, with a pair of scissors. Moreover, antarmukha has never been credited with the power of excising the arm.

13. TRIKŪROCĀKA.

It has been translated in English as a thin-edged sharp instrument or trocar. Wise, Dutt and Hoernle agree to mean by it a trocar. But it can be better explained if we understand by the term an instrument consisting of three needles fixed on a round

अपरञ्च विस्त्रावण शस्त्रमाह तद्वदित्यादि तद्वत् कुशाटीवदनवत्, अन्तर्मुखं अन्तर्मुखं नाम शस्त्रं ज्ञात्वे योज्यं तस्य अन्तर्मुखस्य फलं अर्धचन्द्राङ्गुलं स्यात् । आधि अधिकं अर्धं अर्धञ्च । सार्द्धकमङ्गुलमित्यर्थः ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

¹ अर्धचन्द्राननं चेत् तथाध्यङ्गाङ्गुलं फले ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

अन्तर्मुखस्य प्रकारमेदमाह अर्धचन्द्राननमित्यादि एतत् अन्तर्मुखं, अर्धचन्द्राननं अर्धचन्द्राकारमुखञ्च भवति, तदपि तद्वत्, कुशाटीवदनवत् ज्ञात्वे योज्यं । तच्च फले अर्धङ्गुलं अर्धङ्गुलपरिमाणं फलमित्यर्थः । अर्धचन्द्राकारमुखत्वात् अस्य शस्त्रस्यापि अर्धचन्द्राननमिति संज्ञेति बोध्यं ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

² अथवा अर्धचन्द्रेण शस्त्रेणैव सततगर्भस्य बाहुयुगलं सञ्जिद्य बाह्वनिःसारयेत् ।

Hārīta Saṁhitā, III, li.

wooden handle¹. According to Suśruta, the length of the instrument is six aṅguli. But others describe it as eight aṅguli long, the blade and the handle measuring three and five aṅguli respectively². The distance between the edges is the breadth of a grain of rice. The end of the handle is ornamented with a circular metallic plate as a ring.

It is recommended to be used for evacuating abscesses and for draining blood from the nasal polypus.

Caraka³ mentions an instrument called kūrcca and says:—
“After fomenting and thus softening the rounded nodules (of leprosy) which are fixed and hard, by heated stones and fumigations through tubes, they are to be injured by the kūrcca and the blood that oozes out, should be wiped away.”

Two other instruments are described by Vāgbhaṭa as being constructed on a similar principle. One is named kūrcca and the

¹ चिकृर्चकमिति त्रयः कूर्चा यस्य तत् चिकृर्चकम् । कूर्चः कूर्चो इति लोके ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

² चिकृर्चकमिति त्रयः कूर्चा यस्य तत् चिकृर्चकम् तच्च तन्वान्तरम् :—

अङ्गुलानि तथाष्टौ च शस्त्रं कार्यं चिकृर्चकम् ।

फलैरन्तर्मुखाकारैर्वङ्गुलैरन्वितं विभिः ।

एकेकस्य कलस्यैषामन्तरं त्रौहिसन्धितम् ।

इत्तं पञ्चाङ्गुल्यायाम् कार्यं रुचकमूषितम् ॥

Nivandha Saṁgraha, I. viii.

³ स्थिरकठिनमण्डलानां खिन्नानां प्रस्तरप्रणाङ्गीभिः ।

कूर्चैर्विघटितानां रक्तोत्क्षेपशोऽपनेतव्यः ॥

Caraka Saṁhitā, VI. vii.

other, khaja. The kūrcca¹, he describes as an instrument “consisting of seven or eight rounded sharp needles, four aṅguli long, nicely bound together by a cord and tightly fixed on a circular wooden handle.” He mentions its use in the operation of scratching to cure baldness and the brown and black spots on the face. For scarifying a bald spot, Cakradatta² uses needles, rough leaves, etc. “The khaja³,” Vāgbhaṭa continues, “consists of eight rounded needles having the sharp ends half an aṅguli long. It is to be introduced

¹ कूर्चवृत्तैक पीठस्थाः सप्ताष्टौ वा सुवन्धनाः ।

संयोज्य नीलिका व्यङ्ग केश शतेषु कुट्टने ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

सम्प्रति कूर्चाख्यं शस्त्रं लक्षयितुमाह सर्व्वेत्यादि ताः सूच्यः सर्व्वेव वृत्ताः वर्तुलाः तथा चतुरङ्गुलाः चतुरङ्गुलदीर्घाः कृच्चः इत्युच्यते । ताः सूच्यः पुनः कौटशाः ? वृत्तेकपीठस्थाः वृत्ते वर्तुले एकस्मिन् पृष्ठे संस्थिताः, एकं वृत्ताकारं काष्ठफलकं परिवेष्ट्य स्थिता इत्यर्थः । तथा सप्तसंख्यका अष्टसंख्यका वा, तथा शोभनं रज्ज्वादिकृतं बन्धनं यासां तास्तथाविधाः सुवन्धनाः । स कूर्चः नीलिकादिषु रोगेषु कुट्टने कुट्टनार्थं संयोज्यः प्रयोज्य इत्यर्थः । कुट्टनं आच्छान इति लोके । नीलिकादयो बल्यमाणा केशशतैः केशानां पतनं ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

² अवगाढपदस्यैव पुच्छयित्वा पुनः पुनः ।

Cakradatta, Kṣudraroga Cikitsā.

अवगाढपदमिति गम्भीरपदं यथास्यात् तथाः सूचीनखरञ्ज्यादिभिः पुच्छयित्वा * * *

Tattva Candrikā, ibid.

³ अर्द्धाङ्गुलमुर्ध्वैर्वात्तरेष्टाभिः कण्टकैः खजः ।

पाणिभ्यां मध्यमाणेन प्राणात्तेन हरेदष्टक् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

खजसंज्ञकशस्त्रमाह अर्द्धाङ्गुलमुखैरित्यादि अर्द्धाङ्गुलप्रमाणं मुखं येषां ते अर्द्धाङ्गुलमुखोऽसौ अर्द्धाङ्गुलमुखः वृत्तेः वर्तुलैः अष्टाभिः अष्टसंख्यकैः कण्टकैः कृतं शस्त्रं खज उच्यते । तेन खजाख्येन शस्त्रेण पाणिभ्यां हस्ताभ्यां मध्यमाणेन आलोच्यमाणेन प्राणात् नासिकायाः अष्टकर्तुं हरेत्, निर्हरेदित्यर्थः ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

into the nostrils and turned to and fro with both hands to bleed the nasal polypi."

The Greeks and Romans used a similar instrument for identical purpose. It was called *katiádion*, measuring a blade of grass, and was used for opening abscesses of the womb and tonsils, drawing blood from the inside of the nose and perforating the foetal cranium.

In India, the practice of drawing blood from the nasal polypus by blades of grass is still in vogue; and *Aræteus* mentions it as a common mode of scarification in ancient Greece also¹. "On the next day we are to abstract blood from the inside of the nostrils, and for this purpose push into them the long instrument named *Katiádion*, or the one named *Toryne*, or in want of these we must take the thick quill of a goose; and having scraped the nervous part of it into teeth like a saw, we are to push it down the nostrils as far as the ethmoid cells, then shake it with both hands, so that the part may be scarified by its teeth. Thus we shall have a ready and copious flow of blood; for slender veins terminate there and the parts are soft and easily cut. The common people have many modes of scarification, by rougher herbs and dried leaves of the bay, which they introduce with the fingers and move strongly." *Paul*² opens the vessels in the nostrils with the reed called *typha*.

14. KUTHĀRIKĀ.

It is a small instrument shaped like an axe, so called from its resemblance to *kuthāra*, an axe which is still used in India

¹ Extant works of *Aræteus*, P. 460.

² *Paul*, vol. II. Sec. ix.

for cutting wood¹. Vāgbhata says² that "the base of the blade is thicker and broader than the end and is fitted to a handle, seven and a half aṅguli long. The blade which is shaped like the tooth of a cow, has the width of one aṅguli." Bhoja describes the width of the blade to be a half aṅguli³. It is recommended to be used for puncturing vessels in the following manner⁴:—"Hold the handle with the left hand and put the blade on the vessel resting on a bone. Raise the instrument a little upwards and then strike over the thick base of the blade with the downward strokes of the middle or index finger, when let go

¹ For figure of Kuṭhāra as used in Ancient India, see Pl. xxii in Fergusson's Tree and Serpent Worship.

² पृथुः कुठारी गोदन्तसदृशाङ्गुलानना ।

तयोर्दृष्ट्या विध्येदपर्यस्थौ शिरां स्थितां ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

कुठारिका संशकं शस्त्रमाह पृथुरित्यादि कुठारी पृथुः स्यात् । कुठारिका नामशस्त्रं पृथुः स्थूलमूलं स्यादित्यर्थः । तथा गोदन्तसदृशाङ्गुलानना गवां दन्तः गोदन्तः सत्सदृशं तुल्याकृतं चर्द्वाङ्गुलायतं आननं मुखं यस्याः सा तथा विधया तया कुठार्या जर्ददृष्ट्या चस्थौ उपरिस्थितां शिरां विध्येत् । तद्वृष्टं वामहस्तेनोच्चैः कुठार्यामुखं शिरोपरि संस्थाय दक्षिणाङ्गुष्ठतर्जनीभ्यां कुठारिकामसक्तकमभिहत्य शिरां विध्येत् ।

Vāgbhaṭārtha Kanmūdī, I. xxvi.

³ कुठारिकेति कुठारतुल्या कुठारिकाः—

कुठारिकाया इन्तं स्यात् सार्द्धसप्ताङ्गुलायतं ।

फलमर्द्वाङ्गुलायतं गोदन्तसदृशं समम् ॥

Nivandha Saṁgraha, I. viii.

⁴ तथा मध्यमयाङ्गुल्या वैद्योऽङ्गुष्ठं विस्तृताया ।

ताडयेदुत्थितां ज्ञात्वा स्पर्शाद्वाङ्गुष्ठं पीडनैः ॥

कुठार्यां सचयेन्मध्ये वामहस्तं गृहीतया ।

फलोद्देशे मुनिष्कम्पं शिरां तद्वच्च सोचयेत् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvii.

forcibly from the under surface of the thumb". Cakradatta¹ also advises us to use it in a similar manner. To open the veins in fleshy parts, Vāgbhaṭa recommends the vṛihimukha knife, while the kuṭhārikā is advised to be used in venesection on bony structures.²

Pālakāpya³ mentions the kuṭhāra and describes its shape to be like an axe. It is to be used for excision and scarification. He describes another śastra called vatsadanta (*lit.*, the calf's tooth); it is ten aṅguli long; and the mouth of the instrument is one and a half aṅguli broad. It is also to be used for excision.

"Bleeding from the jugular vein, he (Albucasis) describes much in the same way that it is now practised by veterinary surgeons, namely, by placing a sort of scalpel bent at the point, which he calls fissorium, upon the vein, and striking the instrument with a hammer or some such body. He gives drawings of variously shaped lancets for opening the veins of the arm."⁴

"Ferriers bleed with a fleam, which, though apparently a clumsy method of operating, is certainly safer than the lancet in

¹ वासङ्गसेन विन्यस्य कुठारीमितरेण तु ।

ताडयेन्मध्यमाङ्गुल्याङ्गुलविष्टम्सुक्ष्माया ॥

Cakradatta Śirāvyādhādhikāra.

² मांसले निक्षिपेद्दे श्चे व्रीहासं व्रीहिमात्रकम् ।

यवावर्गमस्यासुपरि शिरां विध्वन् कुठारिकाम् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvii.

³ कुठाराकृतिं कुर्यात् । कुठारी शस्त्रप्रच्छेदनार्थं । वत्सदन्ताकृतिं वत्सदन्तं दशाङ्गुलम् । एकेकमध्यमाङ्गुलसुखम् । एवमेतानि च वीर्यपि यथायोगं प्रच्छेदयन् ।

* * * * *

कुठाराकृतिशस्त्रेण ततस्तं प्रच्छेदयेद्विषक् ।

नातिगाढं न च लघुं न घनं विरलं न च ॥

Pālakāpya, III. iii.

⁴ Albucasis Chirrug. ii. 97; also see Adam's Commentary on Paul, VI. lx. 323.

unknown hands." "In bleeding with a fleam, the near side is most convenient. In skilful hands, there is no occasion for a blood stick, as the fleam may be struck with the right hand if it is made broad and round at the back. It also may be made much smaller and neater than that generally employed". There is a drawing of such an improved fleam which much resembles in appearance the kuṭhārī of the Hindus. "A fleam is rather more convenient instrument in bleeding, either from the arm or thigh, as the vein is somewhat apt to roll when a lancet is used."¹

15. VRĪHIMUKHA.

It is described as a kind of trocar², the sharp end being pointed and shaped like a grain of paddy. It is six āṅguli long, the handle being two and the blade four āṅguli (Bhoja). But Vāgbhaṭa³ describes the length of the blade to be one and a half āṅguli.

It is advised to be used for paracentesis abdominis in abdominal dropsy. Suśruta says:⁴ "The friends of the patient should

¹ White's Compendium of the Veterinary Art, 1851, 18th ed. P. 342.

² ब्रीहिसुखमिति ब्रीहिसुखमिव सुखमस्य ब्रीहिसुखं तत्र भोजः—

शस्त्रं ब्रीहिसुखं कार्यमङ्गुलानि षडायतम् ।

द्वाङ्गुलं तस्य वृत्तं सप्तात् तत्फलं चतुरङ्गुलम् ।

तम्बुखं ब्रीहिविस्तारं तनुसंगूढकण्टकम् ॥

Nivandha Saṁgraha, I. viii.

³ * * * * * तथाध्यर्द्वाङ्गुलं फले ।

ब्रीहिवक्त्रं

* * *

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi,

⁴ उदकोदरिणस्तु वातहरतैलाभ्यक्तस्याणोदकस्निग्धस्य स्थितस्याप्तैः सुपरिगृहीतस्याकषात्-
परिवेष्टितस्याधो नाभेर्वांमन्तश्चतुरङ्गुलमपह्नाय रोमराज्या ब्रीहिसुखेनाङ्गुलीदरं प्रमाणमवगाढं
विध्यते ॥

Suśrutā Saṁhitā, IV. xiv,

hold him under the axilla. Then the abdomen is to be tapped by the vṛhimukha knife at a point, four āṅguli distant on the left side from the median line, underneath the navel." Vāgbhaṭa¹ advises us to surround a broad bandage round the abdomen before tapping it by the instrument, which he recommends to be introduced up to one āṅguli. Cakradatta² refers to works on surgery for the surgical treatment of ascites. A small incision is directed to be made before the puncture.

In the Aśvavaidyaka, for this operation, the utpalapatra knife is recommended; an incision four āṅguli long is directed to be made above or below the navel of the horse, and then the end of the knife is to be plunged into the abdominal cavity up to one āṅguli.³ The vṛhimukha is also advised to be similarly used.⁴

Hippocrates speaks of evacuating the fluid in paracentesis abdominis with an instrument which Camper thinks must have been a kind of trocar.⁵

सजले जठरे तैलैरभ्यक्तस्यानिष्ठापयैः ।
 स्निग्धसोष्णान्मुना कक्षमुदरे परिवेष्टिते ॥
 वङ्गक्षिद्रोदितोस्थाने विध्यैदङ्गुलमात्रकम् ।
 निधाय तस्मिन्नाङ्गीञ्च स्वावयेर्द्धमभ्यसः ॥
 अथास्य नाङ्गीमात्रेण तैलेन लवणेन च ।
 त्रयमभ्यव्य वहा च वेष्टयेद् वाससीदरम् ॥

Aṣṭāṅga Hṛdaya Samhitā, IV. xv.

* जातं जातं जलं स्वायं शास्त्रोक्तं शस्त्रकर्तव्यं च ।

Cakradatta, Udaracikitsā.

¹ See foot-note, 1. p. 242.

⁴ See foot-note, 4. p. 241.

⁵ See the Commentary on Paul. By Adams, vol. II, P. 338.

It is also to be used for puncturing the vessels in phlebotomy (Vāgbhāṭa)¹ especially in the fleshy parts of the body.² Cakradatta uses vṛhimukha in phlebotomy and says: "The sharp end of the vṛhimukha should be kept under the palm between the thumb and index finger and is to be thrust into the seat of puncture."³

Suśruta directs us to use it in tapping the hydrocele:⁴ "Then the hydrocele is to be wrapped round with a bandage. The fluid is next to be drained by tapping it with a vṛhimukha on the lower part of the scrotum, little externally to the suture." Similar directions are given in the Yogaratnākara.⁵ Cakradatta also gives a similar description.⁶

¹ व्रीहिवक्त्रं प्रयोज्यच्च तत्सिरोदरयोर्वध्येः ।

Aṣṭāṅga Hṛdaya Saṁhitā. I. xxvi.

व्रीहिमुखं शस्त्रं चाह व्रीहिवक्त्रमित्यादि व्रीहिवक्त्रमिव वक्त्रं यस्य तत् व्रीहिवक्त्रं । व्रीहिमुखं यत्शस्त्रं तत्सिरानां व्यधे व्यधने तथा उदरस्य जलोदरस्य व्यधे स्नावसाथं योज्यं ।

Vāgbhāṭārtha Kaumudī. IV. xxvi.

ताडयन् पीडयेच्चैनां विध्येद् व्रीहिमुखेन तु ।

Aṣṭāṅga, Hṛdaya Saṁhitā, I. xxvii.

² मांसले निःक्षिपेद्देशे व्रीहास्यं व्रीहिमाचकम् ।

Ibid.

मांसलेष्ववकाशेषु यवमात्रं शस्त्रं निदध्यादतोऽङ्गुलैश्च यवमात्रं व्रीहिमात्रं वा व्रीहिमुखेन ।

Suśrutā Saṁhitā. IV. viii.

³ ततो व्रीहिमुखं व्यध्यप्रदेशे न्यस्य पीडयेत् ।

अङ्गुष्ठतर्जनीभ्यास्तु तलप्रच्छादितं भिषक् ॥

Cakradatta Śīrāvyādhādhikāra.

⁴ See foot note 5. P. 123.

⁵ संस्वेद्य सूत्रप्रभवं वस्त्रखण्डेन वेष्टयेत् ।

सौवम्या पार्श्वतोऽवस्थाविध्येत् व्रीहिमुखेण वै ॥

Yogaratanākara.

⁶ संस्वेद्य सूत्रप्रभवां वस्त्रपट्टेन वेष्टयेत् ।

सौवम्याः पार्श्वतोऽवस्थाविध्या व्रीहिमुखेण वै ॥

Chakradatta Vṛddhi Cikitsā.

Paul describes the operation but he recommends a sharp-pointed knife or lancet instead of a trocar. He says: "Wherefore we must make the patient stand erect; or if this can not be done, we must cause him to be seated; * * *. We give orders to the assistants standing behind to press with their hands and push downwards the swelling to the pubes. Then taking a sharp-pointed knife or lancet, if dropsy be among the intestines, in the perpendicular line of the navel, and about three fingers' breadth distance from it we divide the hypogastrium as far as the peritoneum."¹ Celsus mentions that some perform it at a spot four fingers' breadth below the navel in the left side, and recommends us to use a perforator, the point of which should be about the size of the third part of a fingers' breadth.² Vegetius, the veterinary surgeon, recommends paracentesis for the dropsy of cattle.³ The Arabic authors Avicenna,⁴ Serapion,⁵ Albucasis,⁶ Haly Abbas,⁷ and Rhases,⁸ give similar descriptions.

In modern times, we perform the operation in the same way. "It is necessary in certain conditions to tap the abdomen in order to withdraw fluid which has accumulated there and this is usually done by means of a special trocar and canula. The site for tapping is selected, the usual spot being in the middle line, half-way between the umbilicus and the pubes. A

¹ Paulus Ægineta, Bk. VI. l. Syd. Soc. Ed.

² Celsus. vii. 15; ii. 10.

³ Vegetius. Mulom. iii. 25.

⁴ Avicenna, iii. 14; iv. 13.

⁵ Serapion. iv. 7.

⁶ Albucasis: Chirrug. ii. 54.

⁷ Haly Abbas, Pract. ix. 41.

⁸ Rhases, Cont. xix.

small puncture about one-third of an inch long is made with the knife at the spot selected. The trocar and canula to which the rubber tubing is attached, are then thrust through the abdominal wall into the peritoneal cavity.”¹

The Greeks did not describe the operation of tapping the hydrocele. They always preferred the open incision to puncture. Paul uses a knife for making the skin incision, but when the tunica vaginalis is laid bare, he divides it through the middle with a lancet for bleeding.² Some of the Arab authors mention the operation of puncturing the scrotum for hydrocele. If the patient be timid, and do not choose to submit to open incisions, Albucasis advises the surgeon to let out the water either with a scalpel or the instrument used for tapping in dropsy. He states, however, that the water will collect again after this operation.³ Rhases also describes this operation.⁴

In modern times, trapping for hydrocele is still practised. “When trapping a hydrocele the patient should be sitting up in a chair * * *. The scrotum, having been cleansed, is grasped from behind by the left hand * * *. A spot, free from any large veins, is selected on the anterior and lower part of the swelling, and the trocar and canula introduced with sharp stabbing movement.”⁵

Pālakāpya⁶ describes vrīhimukha as shaped like a grain of paddy and recommends it for scission and excision of muñja.

¹ Operations of General Practice. By Corner and Pinches. P. 109, 2nd ed.

² Paulus Aegineta, VI. lxii.

³ Albucasis. Chrug. ii. 62.

⁴ Rhases. Cont. xxiv.

⁵ Operations of General Practice, P. 145.

⁶ शवथं पाटनं चैव कुर्यान्नोद्दिमुच्छेपे तु ।

16. ĀRĀ OR AWL.

It is a long sharp needle in handle, so called from its resemblance to the shoe-maker's instrument known as awl. "It has a total length of sixteen aṅguli, with a sharp end of the size of a sesamum seed. The handle is tapering like a cow's tail and is equal in circumference to the young stem of Dūrvā (Unodon Dactylon)" (Bhoja)¹. Suśruta mentions its length to be six aṅguli. Vāgbhāṭa describes the length to be one aṅguli, the basal half being round, and the terminal half, four cornered and sharp pointed. The terminal part is introduced into the inflammatory swellings to confirm the diagnosis of suppuration. It is also to be used to drain the congested blood vessels in the matrix of the nails as a result of traumatism².

¹ अरिति, अरिव आरा अस्ति: चर्मकाराणां शस्त्रं । तत्र तन्नातरम् :—

आरा द्वाष्टाङ्गुल्यामा कर्तव्या तु विशास्पते ।

तिलप्रमाणान्तु फलं तस्याः कार्यं समाहितं ।

दुर्वाङ्गुरपरीणाहं हन्तं गोपुच्छसन्निभं ।

Nivandha Saṁgraha, I. viii.

² व्यधने कर्णपालीनां युधिका मुकुलानना ।

आराङ्गुलं हत्तास्रा तत्प्रवेशो तथोद्भूतः ॥

चतुरस्रा तथा विध्येच्छीयं पक्कानं स'शये ।

कर्णपालीच वहलां वहलाया न च शस्यते ॥

सूचा विभागशक्तिरा द्वाङ्गुला कर्णवेधनी ।

Aṣṭāṅga Hṛdya Saṁhitā. I. xxvi.

सम्यति कर्णपालिं व्यधन योग्यानि शस्त्राणि वक्तुमाह व्यधने इत्यादि कर्णपालीनां कर्णलतानां व्यधने व्यधनविषये युधिका युधिका नाम शस्त्रं योज्यं । कीदृशी ? मुकुलानना मुकुलवत् प्रकृतत्वात् युधिका मुकुलवत् आननं मुखं यस्याः सा तथाविधा । आरित्यादि अर्द्धाङ्गुलं परिमानं हन्तं वर्त्तुलं आस्यं मुखं यस्याः सा तथा अर्द्धाङ्गुलहत्तास्रा, तथा स एव अर्द्धाङ्गुलप्रमाणः प्रवेशः प्रवेशनं यस्याः सा तथाविधा तत् प्रवेशा तथा ऊर्ध्वतः हत्तास्राङ्गुलादुपरिष्ठात् । तथा अर्द्धाङ्गुल परिमाणैव चतुरस्रा चतुष्कोणा सा आरा कथ्यते ।

It is also said to have been used for perforating a thick lobule of the ear, though for this purpose another instrument called *karna-vedhanī* or ear-perforator—a needle specially meant for perforating the lobules of the ears,—is mentioned. It is three *anṅuli* long, having a slit or eye in the three-fourths of its length. The barbers used a similar needle to perforate the ears on the ceremony of *tōnsure*.

For piercing the lobule of the ear, another instrument is mentioned. It is called *jūthikā*, from its end resembling in shape the conical bud of *jūthikā* flower (*Jasminum Auriculatum*).

Suśruta uses *ārā* or *pāṇimantha* to perforate the bone in diseases of the medullary canal caused by the obstructed and deranged air¹. He next introduces one end of a tube open at.

एतेन आरायाः फलं एकाङ्गुलपरिमितमिति फलति तत्र प्रथमाङ्गुलं द्वचमपराङ्गुलं चतुरस्रं तयोरुभयभागयोर्मध्ये अग्रस्थश्चतुरस्रो भागः प्रवेशयोग्य इति सूचितः । तथा आराया पक्काम संशये अयं शोधः पक्क आमोवेति संशये सति तादृशं शोधं विधेत्, तथा वहलां अतिमांसलां कर्णपालीं च तथा विधेदिति योज्यं । वहलामित्यन्तेन च्छेदः । वहलाया-मित्यादि वहलायाः अतिमांसलायाः कर्णपाल्याः व्यधने कर्णवेधनी नाखी सूची च शस्यते । कीदृशी ? त्रिभागशुषिरा, विभागः शुषिरं गम्यं यस्याः सा तथाविधा विभागशुषिरा तथा वाङ्गुला अङ्गुलवयदीर्घा । न केवलमारा वहलायाः कर्णपाल्या व्यधने शस्यते अपि तु कर्णवेधनी नाखी सूची च शस्यते इत्यर्थः । कर्णवेधनीं सूचीं अस्मद्विश्रया नरसुन्दरा कर्णवेधनार्थं व्यवहरन्ति । अतोऽपं वाङ्गुल्यवर्णयेति ।

Vāgbhaṭārtha Kaumūdī. I. xxvi.

¹ निरुद्धेऽस्थनि वा वायौ पाणिमन्येन दारिते ।

नाडीं दलास्थनि भिषक् चुषयेत् पवनं वली ॥

Suśruta Samhitā. IV. iv.

निरुद्धे इत्यादि । त्वङ्मांसं शस्त्रेण विपाद्य अस्थि पाणिमन्येन अराशस्त्रेण विद्धा तत्र रग्ने विसृष्टीं नाडीं प्रणिधाय मुखमारुतं चूपयेत् लवनापकर्षणं करणीयमिति ।

Nivandha Saṁgraha. IV. iv.

both ends into the canal through the hole in the bone, while through the other end the surgeon sucks out the air by his mouth.

For perforating the ears of the elephants, a similar needle is recommended by Pālakāpya. It is known as karmāra or nālī.

17. VETASAPATRAKA.

It is a long sharp cutting instrument shaped like the leaf of the rattan (*Calamus Rotang*). Its edge is finely serrated and very sharp. The blade and handle are equal in length, measuring four *aṅguli*. Bhoja says: "The blade is one *aṅguli* wide"¹. It is said to have been used for puncturing vessels in phlebotomy².

18. VAPIŚA OR SHARP HOOK.

In shape it is described to resemble the ordinary fish-hook. Bhoja describes the total length to be six *aṅguli*, its hook being half an *aṅguli* and its handle five and a half *aṅguli* long. The end is bent; the curvature varies and may be shaped like a half-moon³.

¹ वेतसपत्रमिति, वेतसपत्रमिव वेतसपत्रमत्र भोजः—

तौष्ण्यमङ्गुलं विस्तरं चतुरङ्गुलायतं ।

अङ्गुलानि तु चत्वारि द्वन् कार्यं विज्ञानता ॥

Nivandha Saṁgraha, I. viii.

² वेतसं व्यधने ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

वेतसपत्रादि शस्त्रमाह वेतसमित्यादि वेतसं वेतसपत्रं नामशस्त्रं सिरादीनां व्यधनं कर्त्तव्यं-
योग्यं । वेतसपत्रवद्दन्तुरत्वासस्य वेतसं वेतसपत्रं वेति संज्ञा ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

³ वङ्गिमिति वङ्गिशतुल्यं वङ्गिं मत्स्यवेधनीमाहुः । तत्र तन्मान्तरं :—

वङ्गिं चापि कर्त्तव्ये प्रमाणे तु षडङ्गुले ।

स्नातवन्तु तयोरेकमेकं नात्यायतं भवेत् ।

Suśruta says¹ : The end of the hook is sharply edged and is said to have resembled the new leaf of Java (*Hordeum vulgare*).

It is recommended by Suśruta² to be used for extraction of foreign bodies, *e.g.*, the extraction of stone from the urethra. Its use is also mentioned for transfixing the membranous expansion in the operation for pterygium³ and for fixing and dragging the uvula and tonsil before the performance of any operation on these parts⁴. Cakradatta⁵ mentions its use for fixing a growth, before its excision by the knife.

अङ्गापञ्चाङ्गुलं बल्लं शेषं कार्यं मुखं तयोः ।

अङ्गचन्द्राकृतिं वक्रं कार्यं नाभ्यान्तरस्य तु ।

स्नानतं नामयेत् तत्र वङ्गिश्चभिषग्वरः ।

बल्लाययोरन्तरं स्याद् यावदङ्गाङ्गुलं सतं ।

Nivandha Saṁgraha, I. viii.

¹ वङ्गिशोदनशङ्कुश्चानताये तीक्ष्णकण्टकं प्रथमयवपत्रमुखे ।

Suśruta Saṁhitā, I. viii.

² यदृच्छया वा सूचमार्गप्रतिपन्नामन्तरासक्तां शुक्राश्मरीं शर्करां वा स्त्रीतसा अपहरेत् एवं चाशक्ये विदार्य वा नाडीं शस्त्रेण वङ्गिशोदरेत् ।

Suśrutā Saṁhitā, IV. vii.

³ गृह्येयुष्णिक्कार्मादेर्वङ्गिः सुनताननः ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi

वङ्गिशस्त्रमाह गृह्ये इत्यादि सुष्ठु नतं अङ्गुशवत् नमस्कृतं आननं मुखं यस्य स तथाविधः सुनताननः वङ्गिशं मत्स्यवेधनवत् वङ्गिशोनाम शस्त्रं स्यात् । स च युष्णिक्कार्मादेर्गृह्ये धोन्तं । आदिपदेश उपजिह्विकादि परिग्रहः ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

⁴ पिङ्गकामुत्तमाख्याश्च वङ्गिशोदुरेद्विषक् ।

उडृत्य मधुसंयुक्तैः कषायेरवचूर्णयेत् ॥

Suśruta Saṁhitā, IV. xxi.

⁵ उत्तमाख्यान्तुपिङ्गकां संख्यं वङ्गिशोदृत्याम् ।

Cakradatta, Śukrādoṣa Cikitsā.

It was also used for fixing any growth in the eye, previous to its excision by the *maṇḍalāgra*¹. For this purpose the Greeks used the *vulsellum* (*myzon*). Aetius says: "If there is a large and malignant excrescence in the angle of the orbit, the enlarged part must be seized with *vulsella* and cut off."²

Evidently *vaḍiśa* was used on many occasions when in modern times we use the dissection forceps to steady a part before excision.

Vaḍiśa is described in the *Aśvavaidyaka*³ to have been similarly used during the operation of pterygium in horses.

*Pālākāpya*⁴ mentions *vaḍiśa* which is described as eight *aṅguli* long, the end being rounded like a wheel. It is to be used for raising the membranes of the eye globe.

Sharp hooks were used by the Greeks and Romans, for similar purposes. The use of the sharp hook for fixing the pterygium is mentioned by Celsus⁵, Aetius⁶, Paul⁷ and Albucasis⁸.

Its use in the excision of the tonsil is mentioned by Paul⁹. After the patient being placed in the proper position, he narrates: "We take a hook (*tenaculum*) and perforate the

¹ See foot notes 1, 2 and 3, P. 227.

² Aetius. vi. 74.

³ चित्ती निपात्य तुरगं तलोनेन प्रसारयेत् ।

शतकर्मा भिषग्विद्वान् वडिशीनाच्चिबत्सं नि ॥

Aśvavaidyaka, XXX. v. 32.

⁴ वडिश्यं चक्रायमष्टाङ्गुलप्रमाणमच्छोः पटलोद्धरणार्थं चेति ।

Pālākāpya, III. xxx.

⁵ Celsus. VII. vii.

⁶ Aetius. Tet. ii, iii, 60.

⁷ Paul. VI. xviii.

⁸ Albucasis. Chirrug. ii, 16.

⁹ Paul. VI. xxx.

tonsil with it, and drag it outwards as much as we can without drawing its membranes along with it, and then we cut it out by the root with the scalpel suited to the hand, called ancylotomus, for there are two such instruments, having opposite characters”.

19. DANTA ŚĀṆKU OR TOOTH-SCALER.

Its head is half an aṅguli long. It is quadrangular in shape and has a sharp edge. Suśruta ¹ describes the end as slightly bent, sharp and shaped like the fresh leaf of Java. Bhoja ² describes the end to be like that of the vṛihimukha.

Vāgbhaṭa³ describes a similar instrument called dantalekhana or tooth-scaler. It is also quadrangular in shape, one side being sharp-edged and the opposite side little lengthened. It is .

¹ See foot note 1. P. 265.

² एव हि क्रियते एतौ दशशङ्कुर्विज्ञानता ।
शङ्कु वच्च मुखं तस्य कार्यमङ्गुलायतम् ॥
चतुरस्रं समञ्चेव तीक्ष्णधारं समाहितं ।
इत्यायं तस्य कर्तव्यं शस्त्रं व्रीहिमुखाकृतिः ।
कपालिकां शर्कराञ्च दन्तस्थानेन शोधयेत् ॥

Nivandha Saṅgraha, I. viii.

³ एकधारं चतुष्कोणं प्रवृत्ताकृति चैकतः ।
दन्तलेखनकं तेन शोधयेद्दन्तशर्करान् ॥

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

दन्तलेखन शस्त्रमाह एक धारमित्यादि एका धारा यस्य तत् एकधारं चत्वारः कोणा यस्य तत् चतुष्कोणं कोणः कोणा इति यस्य प्रसिद्धिः तथा एकतः एकदेशात् प्रवृत्ता वर्तमानशीला आकृतिः आकारो यस्य तत्तथाविधं प्रवृत्ताकृति दन्तलेखनं दन्तलेखनाख्यं शस्त्रं स्यात् तेन दन्तलेखनाख्येन शस्त्रेण दन्तशर्करान् दन्तनिवृद्धान् शर्कराख्यान् लेखयेत् कर्शयेदित्यर्थः । दन्तालिख्यन्ते अनेनेति दन्तलेखनं दन्तशर्करा पाथरि इति लोके ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

recommended to be used for the extraction of sordes and tartar from the teeth ¹.

The procedure of the operation of tooth-extraction is not described in detail in the medical books of the Hindus. But the operation seems to have been well known, for Suśruta distinctly advises the students to practise the operation of extraction on the fruits of Panas (*Atrocarpus Integrifolia*), Vimbi (*Cephalandra Indica*), Vilva (*Ægle Marmelos*) and on the teeth of the dead animals ². He also advises us to extract the wisdom teeth and to apply cautery to their sockets ³. Also when a tooth becomes loose he directs us to extract it and apply cautery to the socket ⁴. In the treatment of sinus caused by carious tooth, he advises us to extract the tooth, otherwise the sinus would extend down to the inferior maxillary bone ⁵.

¹ शस्त्रेण दन्तवैदर्भे दन्तसूलानि शोधयेत् ।

* * * *

अहिंसन् दन्तसूलानि शर्करासुद्वरेद भिषक् ।

Suśruta Saṁhitā, IV. xxii.

² See foot note 2. P. 280.

³ उद्वृत्त्याधिकदन्तान्तु ततोऽग्निमवचारयेत् ।

कृमिदन्तक-वन्धापि विधिः कार्यो विज्ञानता ॥

Suśruta Saṁhitā, IV. xxii,

⁴ चलसुद्वृत्य च स्थणं विदहेच्छुधिरस्य च ।

Ibid.

⁵ यन्दन्तमधिजायेत नाङ्गी तंदन्तसुद्वरेत् ।

खिला मांसानि शस्त्रेण यदि नोपरिजोभवेत् ॥

शोधयित्वा दद्वेष्टापि चारेण ज्वलनेन वा ।

भिनन्त्युपेक्षिते दन्ते हनुकास्थि गतिप्रवृत् ॥

समूलं दशनं तस्मादुद्वरेद भग्नमस्थि च ॥

उद्वृतेतूतरे दन्ते सगुली स्थिरवन्धने ॥

Ibid.

*Pālakāpya*¹ mentions the extraction of tooth of the elephant by means of *enīpada* which is an iron bar, thirty-two *āṅguli* long and equal to the tooth in circumference.

Paul says²: "The *laminæ* which unite to them (the teeth) we may remove as may appear proper, with the concave part of a *specillum*, a *raspatory*, or a file." The operation of tooth-extraction was however, not liked by the ancient Greeks as cases in which the operation proved fatal, occurred in their practice. *Cælius Aurelianus*, *Herophilus*, and *Galen* disapprove in general of the operation, except in extreme cases.

It would, no doubt, be interesting to know that in ancient India, the Hindus knew how to make false teeth to be used by men who have lost them either by accident or by extraction by the dentists. In 1194 A.D., *Sahabuddin* defeated *Jayacandīa* in battle, "and the incident of the body of the *rāja* being recognised by his false teeth³—a circumstance which throws some light on the state of manners" is well known.

20. EṢANĪ OR SHARP PROBES.

"The probes", says *Caraka* ⁴, "are of two kinds, the hard or

¹ द्वाविंशदङ्गुलायतदशनपरिनाह्निन लौहदण्डेन ।
एनीपदेन कुर्यादुद्धरणं तयोः सम्यक् ॥
ब्रौहिमुखेन च परिशोध्य सर्व्वस्य दन्तमूलैषु ।
उण्णोदकघौतेषु मधुसर्पिः पूरणं दद्यात् ॥

Pālakāpya, III. xviii.

² Paul. VI. xxviii.

³ Elphinstone's History of India, P. 365, 5th Ed.

⁴ द्विविधामेषणां विद्यान्महीच्च कठिनामपि ।
उद्भिदैश्च दुर्भिनर्लैर्लोहानां वा शलाकया ॥
गभीरमांसगे देशे पात्रे लौहशलाकया ।
एष्यं विद्याद् व्रणं नालेविपरीतमती भिषक् ॥

Caraka Saṁhitā, VI. xiii.

metallic probes, and the soft probes such as the young stems of plants. The hard probes are required for deep sinuses in the fleshy parts and the sides of the body, while the softer varieties are used for probing the superficial sinuses". The ends of the probes are generally shaped like the head of the earth-worms¹. Suśruta² describes them to be eight aṅguli long. They are to be used as probes to ascertain the direction of sinuses.³ The blunt probes have been described before under the śalākās.⁴

The sharp probes have the shape of a needle and are six aṅguli long. The other end carries an eye through which is put one end of a caustic thread (*i.e.*, thread soaked in caustic lotion and then dried). The probe is to be used for piercing the tissues through the blind end of the sinus. The end of the thread is next to be withdrawn from the eye of the probe and a tight knot applied with the other end. The intervening bridge of tissues is thus gradually cut and the sinus opened. If the cord be found inefficient for the purpose, a second thread is to be tied similarly.⁵

¹ एषणी गण्डुपदाकारमुखी ।

Suśruta Samhitā, I. viii.

² तच्च नखशस्त्रं वक्ष्यावष्टाङ्गुलि ।

Ibid.

³ गतेरन्वेषणे श्लक्षा गण्डुपदमुखैषणी ।

Aṣṭāṅga Hṛdya Samhitā, I. xxvi.

एषाम्यस्य शस्त्रमाह गतेरित्यादि एषणीनाम शस्त्रं गतेः नाडीत्रयस्य पूयादिपथस्य अन्वेषणे अन्वेषणे योज्यं । सा चैषणी श्लक्षा कोमलस्पर्शा, तथा गण्डुपदमुखा, महीलता मुखकार मुखा च भवति ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

⁴ See page 155-7.

⁵ कश्चदुर्वलमीरुषां नाडीमर्शयिताच या ।

आरसूत्रेण तां किम्यात्र तु शस्त्रेण बुद्धिमान् ॥

This method of treatment is recommended for the weak and timid patients. The needle-shaped probe is also to be used in the extirpation of new growths by means of caustic threads. Cakradatta¹ also describes this operation; evidently he copies it from Suśruta. In the Yogaratnākara² the verses describing the operation are also quoted. Vāgbhaṭa also mentions a needle-shaped probe for the same purpose.³

In treating of fistula-in-ano, Paul quotes from Hippocrates and says⁴ :—“For Hippocrates directs us to pass a raw thread,

एषणा गतिमन्विष्य चारसूत्रानुसारिणीम् ।
 सूचीं निदध्याङ्गुल्यन्ते तथोन्नम्याय निहरेत् ॥
 सूत्रस्रान्तं समानीय गाढवन्धं समाचरेत् ।
 ततः चार वलं वीक्ष्य सूत्रमन्यत् प्रवेशयेत् ॥
 चाराक्तं मतिमान् वैद्यो यावन्नच्छिद्यते गतिः ।
 भगन्दरेऽप्येष विधिः कार्यः वैद्येन जानता ॥
 अर्बुदादिसु चोत्क्षिप्य मूले सूत्रं निधापयेत् ।
 सूचीभिर्याववक्त्राभिराचितं वाः समन्ततः ।
 मूले सूत्रेण वध्नीयाच्छिन्ने चोपचरेन्नरः ॥

Suśruta Saṁhitā, IV. xvii.

¹ These verses are quoted in the Cakradatta, Nāḍivraṇa Cikitsā.

² Also quoted in the Yogaratnākara, P. 346.

³ भेदनाथेऽपरा सूचीसुखा मूलनिविष्टता ।

Aṣṭāṅga Hṛdaya Saṁhitā, I. xxvi.

अपरसंश्लेषणी शस्त्रमाह । भेदनाथे इत्यादि भेदनाथे नाडीव्रणानां गतिभेदनार्थं अपरा पूर्वोक्ताया एषणा अन्या सूचीसुखा सूत्राकार सुखा स्यात् तथा मूले मूलदिशि निविष्टं, सूत्रनिवेश योग्यं खं छिद्रं यस्य सा मूलनिविष्टता सच्छिद्रमूलमित्यर्थः । अस्या एषणामूले छिद्रकरणं चारक्तसूत्रनिबन्धनार्थं । तेन प्रभिन्नं द्वारनिष्काशितेन दृढवन्धेन चारसूत्रेण नाडीव्रणः प्रकाश्यते ।

Vāgbhaṭārtha Kaumūdī, I. xxvi.

consisting of five pieces; through the fistula by means of a probe having a perforation, or a double headed specillum; and to tie the ends of the thread and tighten it every day until the whole intermediate substance between the orifices be divided and the ligature fall out". Hippocrates ¹ describes minutely the apolinose and recommends it for those who from timidity avoid a surgical operation. Celsus recommends the thread to be smeared with some escharotic ointment. The process, he says, is slow but free from pain². Albucasis ³ also approves of the operation according to circumstances. The operation called apolinose *i.e.*, by the ligature, is very celebrated. Ambrose Pare, Foubert, Camper, Giudo de Cauliaco and Rogerius approve of the ligature. It has been recommended by some of the modern surgeons⁴. The operation is still practised in India by the Madras specialists for fistula-in-ano.

Vāgbhāṭa ⁵ describes copper probes having the sharp ends shaped like the buds of Kuravaka (*Baleria Cristata*) to be used in

¹ Hippocrates. 'De Fistulis'.

² Celsus. vii. 4.

³ Albucasis. Chirrug. ii. 80.

⁴ Lancet. vol. I. 1845, new series.

⁵ ताम्बी शलाका द्विसुखा मुखे कुरवकाकृतिः ।

लिङ्गनाथं तथा विध्येत् ॥

• Aṣṭāṅga Hṛdaya Saṁhitā. I. xxvi.

शलाका शस्त्रं अङ्गुलि शस्त्रञ्चाह ताम्बीत्यादि द्विसुखा, द्विहारा, मुखे, मुखप्रदेशे कुरवका कृतिः, रक्तमिश्रीपुष्प मुकुलकारा, ताम्बी, ताम्रमयी, शलाका, शलाका शस्त्रं स्यात् । तथा शलाकाया लिङ्गनाथं, कफोत्पन्नं पटल संज्ञकं चक्षुरोग विशेषं विध्येत् । विध्येदित्यनेन नन्दः ।

Vagbhāṭārtha Kaumūdī I. xxvi.

the operation of cataract. Suśruta¹ describes such a probe to be eight aṅguli long, made of copper, or iron, or gold, the ends being shaped like buds. A thread is spirally twisted round the middle of the instrument for a length of a thumb's breadth, to afford a firm grasp by the surgeon's fingers. This instrument must not be rough, thick or very sharp, for then there would be a greater chance of the eye being injured more than is necessary and at many places. So also in couching of cataract, Celsus says: "Then a needle is to be applied, sharp so as to penetrate, but not too fine."²

Pālakāpya³ mentions eṣaṇī in the surgical treatment of diseases of the elephants. He describes three probes,—smooth and shaped like the collyrium rods. They are recommended to be ten, twenty and thirty aṅguli long respectively.

- ¹ शलाका कर्कशाश्ल' खरा दोषपरिभ्रुति' ।
 ब्रण' विशाल' स्थुलाभा तीक्ष्णा हिंसादनेकधा ॥
 जलास्त्रावन्तु विषमा क्रियासङ्गमयास्थिरा ।
 करोति वर्जिता दोषैस्तत्त्वादिभिर्हिता भवेत् ॥
 अष्टाङ्गुलायता मध्ये सूत्रेण परिवेष्टिता ।
 अङ्गुष्ठ पर्वसमिता वक्रयोर्ध्नुकुला कृतिः ॥
 ताम्बायसी शतकीर्णौ शलाका सप्तादनिन्दिता ।

Suśruta Samhitā, VI. xvii.

² Celsus. VII. viii.

- ³ स्थिरा सृष्टौ च कर्कश्या व्रणानामिषणी भवेत् ।
 वृत्ता गच्छुपदमुखी प्रमाणे त्रिशदाङ्गुली ॥
 सुवर्णकृष्यताम्बायामायसी शृङ्गजापि वा ।
 दन्तास्थिविशुदकारुणामिषणी दारुणा भवेत् ॥

Pālakāpya, III. i.

एषणी दशाङ्गुला त्रिशत्यङ्गुला त्रिशदङ्गुला यथायोगमञ्जनशलाकाकृतिः सुखतः कृत्वा समा
 चैवमेतास्त्रिण एषण्यः प्रमाणतः कार्याः ।

Ibid, III. xxx.

The operation of couching for cataractis essentially an Indian operation; and Suśruta describes the operation minutely as follows :—

The operation of couching for cataract.

Suśruta says¹ : “Now we shall describe the treatment of cataract caused by phlegm. If inside the crystalline lens, anything is seen like a half-moon-shaped drop of water or pearl, hard, irregular

१ श्लेष्मिके लिङ्गमाशे तु कर्म वच्मामि सिद्धये ।
 नचेदङ्गोदुषर्माभुविन्दुमुक्ताकृतिः स्थिरः ॥
 विषमो वा तनुर्मध्ये राजिमान्वा बहुप्रभः ।
 दृष्टिस्थो लभ्यते दोषः स्रज्जा वा सुलोहितः ॥
 क्षिप्रस्त्रिभ्रस्र तस्राय काले नात्युष्णशीतले ।
 यन्निवस्थोपविष्टस्र खान्नासां पश्यतः समः ॥
 मतिमान् शुक्लमागौ द्वौ कृष्णामुक्ताश्चपाङ्गतः ।
 उन्मोह्य नयने सम्यक् शिराजाल विवर्जिते ॥
 नाधो नोर्ध्व पार्श्वीयां छिद्रे देवकृते ततः ।
 शलाकया प्रयत्नेन विच्छेत् यववक्रया ॥
 मध्य प्रदेशिन्यङ्गुष्ठस्थिरहस्त गृहीतया ।
 दक्षिणेन भिषक् सम्यक् विध्येत् सव्येन चैतरत् ॥
 वारिविन्हागमः सम्यक् भवेच्छब्दस्तथा व्यधे ।
 संसिच्य विद्वसावनु योषितुस्तन्येन कोविदः ॥
 स्थिरे दोषे चले वापि स्वेदयेदक्षि वाह्यतः ।
 सम्यक् शलाकां संस्थाप्याभ्यङ्गैर निलानाशनैः ॥
 शलाकायेण तु ततो निर्झिखेद्वृष्टिमण्डलं ।
 विध्यतो योऽन्य पार्श्वेऽन्धत्वा रुद्धा नासिकापुटं ॥
 उच्छिद्मन्नेन हस्तं व्यो दृष्टिमण्डलजः कफः ।
 निरुध इव घर्ष्यांशुर्व्यदा दृष्टिः प्रकाशते ॥
 तदासौ लिखिता सम्यग् ज्ञेया याचापि निर्व्यथा ।
 ततो दृष्टेः रूपेषु शलाकामाहरेच्छनैः ॥

or thin, striated or shinning, painful or red, caused by the deranged humours, the oleaginous applications and fomentations are to be tried first at a time when it is neither hot nor cold; then he (patient) is to be ligatured after having him seated conveniently, and should be directed to look towards his own nose. The intelligent (surgeon), then separating the white part from the black part and the external canthus of the eye after opening it, avoiding the vascular network, and leaving the parts above and below intact, is to pass a yavamukhī śalākā (or sharp needle having its end resembling a wheat) through a natural opening on the side, steadily holding the rod with the thumb, index and middle fingers. If the operation be required on the right eye, the left hand, and if on the left eye, the right hand of the surgeon should use the needle in puncturing. A successful puncture is known by the escape of a drop of fluid and an audible sound. The experienced surgeon is to sprinkle woman's milk just after the puncture, and keeping the needle there, whether the deranged humour be movable or not, should apply fomentations externally by means of oily remedies for the deranged air. The crystalline lens is next to be scarified by the sharp end of the needle. Then keeping the needle fixed in the side of the eye, the patient should be directed to sniff so as to destroy the phlegm of the lens. The proper scarification will be indicated when the lens appears brilliant as the sun uncovered by clouds. Then the vision being clear, the needle in the side of the eye, is to be removed; and the eye is to be well

घृतेनाभ्यव्य नयनं पस्त्रपट्टेन वेष्टयेत् ।

ततो गृहे निरावाधे शयितोत्तान एव च ॥

soaked with ghee (melted butter) and bandaged properly." Vāgbhāṭa also describes the operation similarly.¹

To this we may compare the account of the operation as given by Celsus. He "lays it down as a rule, that when the suffusion is small, immovable, and of the colour of sea water, or of shinning iron, and if a small degree of light can be perceived at the side, there is reason to hope well of the case. He forbids us to operate until the disease has attained a proper consistence. He directs us to place the patient opposite the operator, who is to sit on a higher seat, while the patient's head

- 1 अथ साधारणे काले शुद्धसंभोजितात्मनः ।
देशे प्रकाशे पूर्वोक्ते भिषग्जानुच्च पीठगः ॥
यान्तिवस्त्रोपविष्टस्य स्निग्धाचस्य मुखानिलैः ।
अङ्गुष्ठं दृढिते नेत्रे दृष्टौ दृष्टोत्प्लवं मलम् ॥
खनासां प्रेक्षमाणस्य निष्कम्पं मुग्धं धारिति ।
कृष्णादर्शान्गुलं सुक्ता तदर्शान्मपाङ्गतः ॥
तर्जनीमध्यमाङ्गुष्ठैः शलाकां निश्चलं घृताम् ।
दैवच्छिद्रं नयेत् पाश्चाद्ग्रीवमास्थयन्निव ॥
सर्वं दक्षिणहस्तेन नेत्रं सव्येन चेतरेत् ।
विध्येत् सुविद्धे शब्दः स्यादरुक् चाम्बुलवक्षुतिः ॥
साल्वयन्नातुरं चानु नेत्रं सव्येन सेचयेत् ।
शलाकायास्ततोऽप्येण निर्लिखेन्नेत्रमण्डलं ॥
अवाधमानः शनकैर्नासां प्रतिगुदंस्तप्तः ।
चच्छिन्नाश्चापहरेद् दृष्टिमण्डलं कफम् ।
स्थिरे द्यौषे चले चापि स्वेदयेदक्षिवाह्यतः ॥
अथ दृष्टेषु रूपेषु शलाकासाहरेच्छनैः ।
घृताप्लवं पितुं दत्त्वा वद्धाच्चं शाययेत्ततः ॥
विज्ञादन्वेन पाशेन तमुचानं हयोर्व्यधे ।
निवाते शयनेऽभ्यक्तशिरः पादं हितरेतम् ॥

is held by an assistant. The sound eye is to be previously covered up with wool. If the left eye is affected, the operator must use his right hand, and *vice versa*. A needle which is sharp and not too slender is to be passed direct through the two coats at a place intermediate between the temporal angle and the black of the eye, and towards the middle of the cataract. When the needle has perforated far enough, which is readily known by the absence of resistance, it is to be turned so as gradually to remove the cataract below the region of the pupil and this object being attained it is to be strongly pressed to the lower part. If it remain there the operation is completed, but if it return, it is to be cut and torn by the needle into many pieces, in which state they are easier depressed, and prove less troublesome. The needle is then to be drawn out direct and soft wool smeared with white of an egg, and other anti-inflammatory applications are to be used. Quiet, restricted diet, and soothing treatment will be proper. ¹ Paul ², Mesue ³, Albucasis ⁴, Rhazes ⁵ and others also describe the operation of couching in similar terms. Albucasis gives figures of these needles.

The operation is still practised in India by the māls who consider themselves specialists in diseases of the eyes.

21. SARPĀŚYA.

Vāgbhāṭa describes an instrument having its end resembling

¹ Celsus. vi. See Adam's Commentary to Paul VI. xxi.

² Paul. VI. xxi.

³ Mesue. De Aegr. oculi, 15.

⁴ Albucasis. Chirrug, ll. 23.

⁵ Rhazes. Ad mansor.

the mouth of a snake ¹. The blade is said to be half an *anṅuli* long. It is advised to be used for excision of the nasal and aural polypi.

The fact that it was able to work inside the nose and the auditory canal shows that it could not have been of any great breadth, possibly less than a quarter of an inch at the most. The exact shape of the *sarpāsya* can not be determined with certainty. The Greeks however used for the same purpose, "a polypus scalpel, having its extremity shaped like a myrtle leaf," which was a double instrument, the other end being a scoop ².

GOLD OR SILVER KNIFE.

To cut the navel cord, Caraka ³ recommends the use of a knife, made of gold, or silver, or iron. To make gold and silver knives of sharp edges seems absonous to our reason, but we must remember that to cut the navel cord, a very keen edge is not required, and even now the purpose is often served by the native *dhāis* with a piece of split bamboo.

¹ सर्पास्यं त्राणकपर्णश्च्छेदनेऽङ्गुलि' फले ॥

Aṣṭāṅga Hṛdaya Saṁhitā. I. xxvi.

सर्पास्यं नाम शस्त्रमाह । सर्पास्यं इत्यादि सर्पास्यं नाम शस्त्रं नासिका कर्णाशसां क्षेदने योज्यं तच्च फले अङ्गुलार्धपरिमितं अङ्गुलिपरिमितं फलकमित्यर्थः । अस्य सर्पसुखसदृशं सुखत्वात् सर्पास्यमिति संज्ञा ।

Vāgbhaṭācārtha Kaumūdī. I. xxvi.

² Paul. VI. xxv.

³ See foot-note 4. P. 65.

•
PRATUDA.

Suśruta mentions it as a knife to be used for making scarifications on the body of a lunatic.¹

The mode of holding the sharp instruments.

Suśruta says ² : “ The vṛddhipatra is to be held at the junction of the handle and the blade; and all instruments used for incision should be held similarly. The vṛddhipatra and maṇḍalāgra, if used for scarification, should be held with the hand raised a little; when used for evacuating abscesses, they, as well as all other instruments, should be held by the fore part of the handle. But in the case of children, old or delicate or timid persons, women, and kings and princes, abscesses should be evacuated with the trikūreca. The vṛhimukha is to be held with the thumb and forefinger, its handle being covered within the palm. The kuṭhārikā is to be held in position with the left hand, and struck with the middle finger when let go forcibly from the under surface of the thumb of the right hand. The āṛā, karapatra and eṣaṇī should be held at their extremities.

¹ प्रतुदैर्दारयेत्त्रेन' मर्च्यवात' विवर्जयेत् ।

सर्पिधाने जरत्कूपे सतत' वा निवासयेत् ॥

Suśruta Saṁhitā, VI. liii.

² तेषामथयोग ग्रहण समासोपायः कस्यसु वक्ष्यते । तत्र वृद्धिपत्रं वृन्तफलसाधारणे भागे गृह्णीयाद्देहनाथेव' सर्वाणि । वृद्धिपत्रं मण्डलाग्रञ्च किञ्चिदुत्तानपाणिना' लेखने बहुशोऽवचार्यं वृन्ताये विस्त्रावणानि । विशेषेण वालवृद्धसुकुमार भीरु नारीणां राज्ञां राजपुत्राणाञ्च विकूर्चकेन विस्त्रावयेत् । तत्र प्रच्छादित वृन्तमङ्गुष्ठ प्रदेशिनीभ्यां व्रीहिमुख' । कुठारिकां वामहस्तन्यसामित-रहस्त मध्यमाङ्गुल्याङ्गुष्ठ विष्टब्ध्याभिह्वन्यात् । आराकरपदैषण्यो मूले । शेषाणि तु यथायोग' गृह्णीयात् ।

Suśruta Saṁhitā, I. viii.

The other instruments are to be held as required in particular cases." Vāgbhata also gives similar directions ¹.

The practical training in surgical operations.

Suśruta says ² : "Even after a pupil has mastered the whole of the medical treatises, the preceptor should instruct him practically how to perform surgical operations and how to administer oils and other medicines. However learned he may be in books, he cannot be fit for surgical practice, unless he has acquired the practical training. Therefore the preceptor should show his pupils the methods of operations, of incision, excision and division, upwards and downwards on the pumpkin, bottle-gourds, water-melons, and the three varieties of cucumbers—Trapuṣa (Cucumis Sativus), Ervārūka (Cucumis Utlissimus), and Karkarūka (Cucumis Melo).

- ¹ केद भेदेन लेख्यायै शस्त्रं वृत्त फलान्तरे ।
तज्जनी मध्याह्नेष्टं क्लीयात् सुसमाहितः ।
विद्यावशादि वृत्तायै तज्जैव्यङ्ग्ये न च ।
तल प्रवृत्त वृत्तायै यावच्च ब्रीहिमुखं सुखे ।
मूलेष्वाहरणार्थानि क्रिया सौकर्यतोऽपरं ॥

Aṣṭāṅga Hṛdaya Saṁhitā. I. xxvi.

² आधिगत सर्वशास्त्रार्थमपि शिष्यं योग्याङ्गारयेत् । कृद्यादिषु खेद्यादिषु च कर्मपथमुप-
दिशेत् । सुवहसुतोषकृत योग्यः कर्मस्वयोग्यो भवति । तत्र पुष्पफलालावू कालिन्दक-
वत् नारकककारक प्रवृत्तिषु कृद्य विशेषान् दर्शयेदुत्कर्तनपरिकर्तनानि चोपदिशेत् ।
इति वसि प्रसेवक प्रवृत्तिषूदकपङ्क पूर्येषु मेष योग्या । सरोजि चर्माण्यातते लेख्यस्य ।
स्त पयसि चरसत्पलनालिषु च वैध्यस्य । पुष्पोपहत काष्ठेण नलनालीयकालावुमुखिष्वस्य ।
पनशुक्तिमनीविस्फालनस्य वृत्तपङ्कतोष्वाङ्गस्य । मधुच्छिद्योपलिते श्यालीफलके विद्याव्यस्य ।
सूक्ष्मवक्त्रात्मयोश्च दुर्घर्मानयोश्च सौम्यस्य । पुस्तमय पुरुषाङ्गप्रत्यङ्ग विशेषेषु वन्ययोग्या ।
वदुर्मासपेजीवुत्पलनालिषु च कर्णसन्धिवन्ययोग्या । वदुषु मांसखण्डेष्वग्निचारयोग्या । उदक
पूषण्टपात्रं खोतखलावुखादिषु च नेत्रप्रणिधानवस्त्रिप्रण वसि पीडन योग्यामिति ।

Suśruta Saṁhitā, 1. ix.

The operation of puncturing or tapping may be demonstrated on leather bags, bladders and pouches, filled with slush; scarifications, on stretched pieces of leather covered with hair; opening on the veins of dead animals or on stalks of water-lily; probing on worm-eaten wood, bamboo, reed, tube or dried bottle-gourd; extraction, on the pulp of jack fruit, the Bael fruit (*Ægle Marmelos*), Vimbī fruit (*Cephalandra Indica*) or on the teeth of dead animals. Evacuation on a lump of wax applied to a board of Śālmali wood (*Bombax Malabaricum*); sewing, on the two ends of a thick piece of cloth or soft leather; bandaging on the limbs of a dummy (human figure made of cloth and clay), bandaging the root of the ear, on a piece of soft flesh, or the stalk of a water-lily; application of cauteries, on pieces of flesh; introduction of tubes for clysters (urethral, rectal and vaginal) and wound-syringe, on the spout of an earthen vessel filled with water, or on the mouth of a bottle-gourd or similar objects."

CHAPTER VII.

THE ANUŚĀSTRA.

The anuśāstra means substitutes for cutting instruments. They are the following¹ :—

1. Bamboo. 2. crystal. 3. glass. 4. ruby. 5. leeches. 6. fire. 7. caustics. 8. the nails. 9. leaves of Goji (*Elephantopus Scaber*), 10. *Sephalikā* (*Nyctanthe Arbortristis*), and 11. *Śākhā* (*Tectona Grandis*). 12. young stems of plants. 13. hair. 14. finger.

These are advised to be used in case of infants or timid persons or when the proper instruments are not available.²

1. BAMBOO.

A piece of split bamboo is said to have been used for cutting through and cutting into some parts of the body. It is still used by the native dhāis or midwives for cutting the funis.

A piece of bamboo is directed to be used for applying pressure on small boils to cure them by subsidence³. For the same purpose, the pressure of the thumb is also recommended⁴.

¹ अनुशस्त्राणि तु त्वकसारस्फटिकाचकुरुत्रिन्दजलौकाग्निचारनखगोजीशफालिका-
शकपव करीरवालाङ्गुलय इति ।

Suśruta Saṁhitā, I. viii.

² शिशूनां शस्त्रभौरुणां शस्त्राभावे च योजयेत् ।

त्वकसारादि चतुर्वर्गं छेद्ये भेद्ये च बुद्धिमान् ॥

Ibid.

³ हृत्तेषु दोषेषु यथानुपूर्व्यं गन्धौ भिषक् श्लेष्म समुत्थिते तु ॥
स्निग्धस्य विस्फापनमेव कुर्यादङ्गुष्ठलोहोपलवेषु दृष्टेः ।

Ibid. IV. xviii.

⁴ अभ्यज्य स्नेदयित्वा च वेणुनाद्या ततः शनैः ।

विस्फापनार्थं सङ्गीयात् तलेनाङ्गुष्ठकेन वा ॥

Cakradatta, Vraṇaśoṭhā Cikitsā.

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श्राकपत्र करीरवालाङ्गुलय इति ।

Suśruta Samhitā, I. viii.

² शिशूनां शस्त्रभीरूणां शस्त्राभावे च योजयेत् ।
त्वकसारादि चतुर्वर्गं केचे मेचे च दुह्मिमान् ॥

Ibid.

³ हस्तेषु दोषेषु यथानुपूर्व्यं यन्मौ भिषक् श्लेष्म समुत्थिते तु ॥
स्निग्धस्य विस्त्रापनमेव कुर्यादङ्गुष्ठलोहोपलवेषु दृष्ट्वैः ।

Ibid. IV. xviii.

⁴ अभ्यज्य स्वेदयित्वा च वेणुनाद्या ततः शनैः ।
विस्त्रापनार्थं सङ्गीयात् तलेनाङ्गुष्ठकेन वा ॥

Cakradatta, Vraṇasothā Cikitsā.

Bamboo is also mentioned to have supplied largely the materials of splints for treatment of fractures and dislocations. For this purpose it is to be split into thin layers¹. Split bamboo is still used for the treatment of fractures by the kavirājes and might advantageously be used by the modern surgeons as a cheap and easily available material for splint.

Dissection.

It is generally supposed that the practice of dissection of the human body for anatomical studies was unknown to the ancients. But the practice of human dissection is unmistakably referred to in the *Suśruta Samhitā*.² Brushes made of bamboo, barks of trees, grass roots, and hairs are mentioned as instruments of dissection. "Thus a body should be secured which is complete in all the parts and which is of a person who was not more than 100 years old, nor who died from the effects of poison or of a chronic disease. Having cleared the intestines of any faecal matter, the body should be well wrapped either in Muñja (*Saccharam Munja*), or grass, or barks of trees or hemp etc., put inside a cage which should be firmly fastened, in a solitary spot, in a calm river and thus allowed to decompose. After seven nights, having taken out

¹ विभग्नश्च नरं दृष्ट्वा वेष्टयन् न वक्ष्येत् ।

सञ्चयेन्नवनीतनैरक्षपत्रश्च वेष्टयेत् ॥

Hārta Samhitā, III. i vi.

² तस्मात्समस्तगात्रमविषोपहतमदौर्घ्याधिपौडितसर्वशक्तिं निःसृष्टलम्पुरीषं पुच्छम-
बद्धन्यासापायां निवृद्धं पञ्जरस्य सुक्ष्मवल्कलकुशश्यादीनामन्यतमैर्वावेष्टिताङ्गमप्रकाशे दीप्ते
कोपयेत् सम्यक् प्रकुपितश्चोद्धृत्य ततो दीह्य' सप्तरात्रादृशीर वासवेष्ट्य वल्कल कुशीनामन्वज्जनेन
जनेः शनैरवचर्चय' कृत्वादीन् सम्मानेन वास्त्राभ्यन्तराङ्गप्रत्यङ्ग विशेषान् यद्योक्तान् सञ्चयेन्नृचा ।

Suśruta Samhitā, III. v.

the thoroughly decomposed body, it should be slowly rubbed with a brush made either of Uṣīra (*Andropogon Muricatus*) or hair, or bamboo, or barks of trees, examining at the same time with the eyes, every division and sub-division of the body, external or internal, beginning with the skin, as delineated in the śāstras." Animal anatomy was also thoroughly understood as each part of the body had its own distinctive name.

Hoernle¹ says : "Probably it will come as a surprise to many as it did to myself, to discover the amount of anatomical knowledge which is disclosed in the works of the earliest medical writers of India. Its extent and accuracy are surprising, when we allow for their early age—probably the sixth century before Christ—and their peculiar methods of definition.***Of the practice of such dissection in ancient India we have direct proof in the medical compendium of Suśruta, and it is indirectly confirmed by the statements of Caraka. It is worthy of note, however, that in the writings of neither of these two oldest Indian medical writers is there any indication of the practice of animal dissection."

The Greeks did not practise dissection of the human body. "The anatomical knowledge of the Hippocratists was derive chiefly from dismemberment of animals, experience in slaughtering and sacrifices, and from the observation of surgical cases. Systematic dissection of the human body was out of the question owing to the religious precepts which strictly enjoined immediate burial, and to the superstitious horror of the dead which then prevailed. The supposition that outstanding individual investigators, upon rare occasions, did not hesitate to examine

¹ Hoernle. Osteology. Preface, iii.

human bodies or parts of bodies (particularly) bones, in order to correct prevailing opinions, is one which, if not susceptible of direct proof, is at least probable. This supposition, besides being borne out by many statements on the part of ancient writers, is the more probable since the bodies of savages, traitors and criminals were outside the pale of religious ordinances and were therefore available, as were also accidentally obtained portions of the body, to satisfy the curiosity of scientific investigators. No one of the oft-quoted extracts from the Hippocratic writings, supposed by individual historians to refer to human dissection, is quite conclusive, whilst nowhere is there in the pathology of the day any definite trace of anatomical research upon the bodies of those dead of disease. On the other hand comparisons are frequently instituted by the Hyppocratists referring to facts acquired through zootomy or to anatomico-pathological discoveries such as might have been made in the slaughtering of beasts.”¹

The study of anatomy received its impetus from the Alexandrian School. “Herophilus improved the technique and developed the terminology of anatomy and enriched it by valuable discoveries made in the dessection of human bodies, particularly in the knowledge of nerves, vessels and viscera, but also in that of the eye. With his works, systematic anatomical investigation may in fact be said to begin.”²

“Like Herophilus, Erasistratos made a successful study of anatomy, even surpassing the former in knowledge of details, and in a series of observations upon the cadavers of men and

¹ History of Medicine. Neuberger. P. 150.

² Ibid. P. 177-8.

animals, corrected his own mistakes as well as those of others. His greatest achievement was in the study of nerves and vessels."¹

2, 3 AND 4. CRYSTAL, GLASS AND RUBY.

These are recommended to be used for cutting through and cutting into some parts of the body.

Glass vessels for preparing medicines are often mentioned. Sārāgadhara² used it for purifying mercury.

5. LEECHES.

Leeches are described to be the mildest of all means for extracting blood, and are recommended for princes, children, women, and timid people³.

Twelve kinds of leeches are described⁴; six of them are poisonous and six, non-poisonous.

¹ History of Medicine. Neuberger. P. 181.

² काचकूप्यां विनिश्चिय ताच्च स्वस्त्रमुद्रया ।

विलिप्य परितो वक्त्रं मूर्ध्नां दत्त्वा च शीषयेत् ॥

Sārāgadhara Saṁgraha, II. xii.

³ वृषाश्चवालस्थविर भीरुदुर्वलनारी सुकुभाराणामनुग्रहार्थं परमसुकुमारोऽयं शोणितावसे च नोपायोऽभिहितो जलौकसः ॥

Suśruta Saṁhitā, I. xiii.

⁴ जलमासामायुरिति जलायुका जनमासामोका इति जलौकसः । ता इति दश तासां सविषाः षट् तावत्य एव निर्विषाः । तत्र सविषाः कृष्णा कर्बुरा अलगाह्वा इन्द्रायुधा सासुद्रिका गोचन्दना चेति । तास्त्रिज्जनचूर्णवर्णा पृथुशिराः कृष्णा । वर्षिमत्स्ववदध्याता क्षिप्रोन्नतकुचिः कर्बुरा । रोमशा महापार्श्वी कृष्णमुख्यलग्ना । इन्द्रायुधवदूर्ध्वराजिभिविदिता इन्द्रायुधा । ईषदसितपीतिका विचित्र पुष्पाकृतिचित्रा सासुद्रिका । गोवृषश्चवदधोभानी त्रिधाम्नाकृतिरगुमुखी गोचन्दनेति । तामिहंष्टे पुरुषे दंष्ट्रे श्वयवुरतिमात्रं कण्डूमुच्छ्रां

The poisonous leeches are :—

1. Kṛṣṇā:—it is of the colour of black collyrium and has a broad head.

ज्वरोदाहृष्टिर्मंदः सदनमितिलिङ्गानि भवन्ति । तच्च महागदः पानालिपनमस्य कर्शादियूप-
योज्यः । इन्द्रायुधादष्टमसाध्यमित्येताः सविषाः सचिकित्सिता व्याख्याताः । अथ निर्व्विषाः ।
कपिला पिङ्गला शङ्कुमुखी मूषिका पुण्डरीकमुखी सावरिकाचेति । तच्च मनःशिलारञ्जिता-
भ्यामिव पार्श्वार्थां पृष्ठे स्निग्धमुद्गवर्णां कपिला । किञ्चिद्रक्ता वृचकाया पिङ्गाश्रुगाच पिङ्गला ।
यत्नवर्णा शीघ्रपायिनी दीर्घतीक्ष्णमुखी शङ्कुमुखी । मूषिकाकृति वर्णाऽनिष्टगन्ता च मूषिका ।
मुद्गवर्णा पुण्डरीकतुल्यवक्त्रा पुण्डरीकमुखी । श्रिग्धा पद्मपत्रवर्णाष्टादशाङ्गुलप्रमाणा सावरिका
साच पञ्चर्षी । इत्येता अविषा व्याख्याताः ।

तासां प्रयुज्यमाणार्द्रचर्मणान्यैर्ज्वा प्रयोगेऽगृहीयात् । अथैनान् नवे महति घटे सरसङ्का-
गोदकपङ्कमावाप्य निदध्यात् । भक्ष्यार्थं चासामूपहरेच्छैवलं बल्लूरमौदकांश्च कल्दां-
शूर्णोक्तव्यं शय्यार्थं दणमौदकानि च पत्राणि । द्वाहान्नाद्वाहान्यज्जलं भक्ष्यं च दद्यात् ।
सप्तरात्रात् सप्तरात्राच्च घटमन्यं संक्रामयेत् । भवति चात्र ।

स्थूलमध्याः परिलिष्टाः पृथ्वी मन्दविचेष्टिताः ।

अगाहिष्ठोऽल्पपायिन्यः सविषाश्च न पूजिताः ॥

अथ जलीकोऽवसिकसाध्यव्याधितमुपवेश्य संवेश्य वा विरुध्य चास्य तमवकाशं गृहीत्य-
चूर्णैर्यथरुजः स्यात् । गृहीताश्च ताः सर्वपरजनौकल्कोदक प्रदिग्धगावोः सलिलसरकमध्ये
मुहूर्त्तस्थिताविगतकृत्वा ज्ञात्वा तालीरोगं ग्राहयेत् । सूक्ष्मशुक्लाद्रपिपुत्रीतावच्छन्नां कृत्वा
सुखमपाठणयादगृह्णन्त्यै चौरविन्दुं शोषितविन्दुं वा दद्याच्छस्त्रपदानि वा कुर्वीत यद्येवमपि न
गृह्णीयात्तदानीं ग्राहयेत् । यदा च निविशतेऽश्वमुरवदानं कालोन्नम्य च क्त्वान्वं तदा
जानीयाद् गृह्णीतीति गृह्णन्तीं चार्द्रवस्त्रावच्छन्नां धारयेत् सीचयेत् । दंशे तोदकन्दुप्रादुर्भा-
वैर्जानीयाच्छुभ्रमिधमादत्त इति शुद्धमाददानामपनयेत् । अथ शोषितगन्धेन न सुखेऽसुखमस्याः
सैन्धवचूर्णनावकिरेत् । अथ पतितान् तण्डुलकण्डनप्रदिग्धगावौ तैललवणाभ्यक्तमुखीं वाम-
हस्ताङ्गुष्ठाङ्गुलीभ्यां गृहीतपुच्छां दक्षिणहस्ताङ्गुष्ठाङ्गुलीभ्यां शनैः शनैरनुलोममनुमार्ज्यवेदा-
सुखज्ञानयेत्तावदावतुसम्यग्वान्तलिङ्गानीति । सम्यग्वान्ता सलिलसरकम्यस्ता भोक्तुकामा सती
चरेत् । या सीदति न चेष्टते सा दुर्ब्बान्ता तां पुनः सम्यग्वामयेत् । दुर्ब्बान्ताया व्याधिर-
साध्यइन्द्रमदो नाम भवति । अथ सुवन्तां पूर्व्ववत् सन्निदध्यात् शोषितस्य च योगाधीगानवेद्य
जलीकोप्रणान्मधुनावघट्येच्छीताभिरङ्गिश्च परिषेचयेवन्नीत वा व्रणं काषाय मधुर स्निग्धशैत्यैश्च
प्रदेष्टैः प्रदिष्टादिति ।

2. *Karvūrā*:—it is as long as an eel with elevated stripes across the abdomen.

3. *Alagarddā*:—it looks as if covered with hair and has large sides and black mouths.

4. *Indrāyudhā*:—or rain-bow coloured; it has rain-bow coloured longitudinal stripes on the back.

5. *Sāmudrikā*:—it is of dark yellow colour and has variegated flower like spots on its body.

6. *Gocandānā*:—it has a bifurcated tail like the scrotum of a bull and a small mouth.

The non-poisonous ones are—

1. *Kapilā* or the greenish one;—it has its two sides of the colour of orpiment, and on its back, it is smooth and of the colour of a green pea.

2. *Piṅgalā* or twany;—it is of a reddish-brown colour, has a round body and moves quickly.

3. *Śaṅku-mukhī* or bluish-red;—it is of the colour of the liver, sucks quickly and has a long sharp mouth.

4. *Mūṣikā* or rat-like;—it has the shape and colour of a rat's tail and emits a disagreeable smell.

5. *Pundarika-mukhī* or lotus-faced;—it is of the colour of a green pea and has a mouth like a lotus.

6. *Savarikā*;—it is slimy, coloured green like a lotus-leaf and eight angulil long; it is to be used in veterinary practice.

The non-poisonous leeches generally live in meadows and fresh water. They are to be caught with a piece of wet leather and

kept in a new large earthen pot filled with mud, water, green fungi, dry flesh, etc. The water is to be changed every third day and the pot every seventh day.

To apply leeches, the patient is directed to lie down and the part is to be rubbed dry with powdered cow dung and earth. The leech is then to be smeared with a paste containing turmeric, mustard and water, to excite them, washed thoroughly with water and then applied, its body being covered with a piece of wet cloth. To fix it quickly, a drop of milk or blood is to be applied over the diseased part, scarification of which is also recommended instead. When the leech has removed the necessary quantity of blood, a small quantity of salt is advised to be sprinkled upon its head to make it drop off. Then the leech is to be put upon some powdered rice and its mouth is advised to be smeared with oil and salt.

Then it is to be stripped and put in fresh water, and should be used again, if it moved, but if languid, thrown away.

The leech-bites are to be smeared with honey, cold water and astringent substances, or poulticed.

Vāgbhata also gives similar directions for the application of leeches.¹

¹ जलीकसन्तु सुखिनां रक्तखावाय योजयेत् ।
दृष्टास्तुमत्स्य मेकाहि श्वकोथमलोद्भवाः ।
रक्ताः श्वेता भृशं कृष्णाश्चपलाः स्थूलपिच्छिलाः ॥
इन्द्रायुधविचित्रोद्भूराजयो रोमशाश्च ताः ।
सविषा वर्जयेत्ताभिः कण्डुपाक ज्वरभमाः ॥
विषपित्तास्त्रनुत् कार्यं तव शुक्लास्तुजाः पुनः ।
निर्विषाः श्वेत्तलश्यावा हृत्ता नीलशैराजयः ॥

Dr. Ray has clearly shown that "the description of leeches as given by Rhazes agrees almost word for word with that of Suśruta (Sanasrad) in many places". He describes the parallelism at length and comes to the conclusion "of the use of a chapter of the Suśruta or some such work¹".

6 AND 7. FIRE AND CAUSTICS.

The use of cauteries in surgery has been described before under the head of the accessory blunt instruments ².

कषाय वृष्टास्तन्वशः किञ्चित् पीतदराश्च याः ॥
 ता अथसम्यग् वमनात् प्रततश्च निपातनात् ।
 सीदन्तीः सलिलं प्राप्य रक्तमत्ता इति व्यजेत् ॥
 अथेतरा निशाकल्क युक्तेऽम्भसि परिष्कृताः ।
 अवन्तिसीमे तक्रोवा पुनश्चाश्रासिता जले ॥
 लागयेद वृत्तमृत्साङ्गं शस्त्रं रक्त निपातनैः ।
 पिवन्तीकृत्तस्तस्माच्छादयेन्मृदुवाससा ॥
 संशृङ्गाङ्गुष्ठं गुह्यासाज्जलीका दृष्टशीघ्रितम् ।
 आदत्ते प्रथमं हंसः चीरं चीरोदकादिव ॥
 दंशस्य तोदे कण्ठ्यां वा मोक्षयेद्दामयेच्च ताम् ।
 पटुतैलाक्तवदनां स्रग्ण कण्डन रुचिताम् ॥
 रचन् रक्तमदाद भुयः सप्ताहं वा न पातयेत् ।
 पूर्व्ववत् पटुता दाशं सम्यग् वान्ते जलीकसाम् ।
 क्रमोऽतियोगाक्षयुर्वा दुर्ब्बान्ते स्तब्धता मदः ॥
 अन्यवान्थ ताः स्थाप्या घटे मृत्स्नाम्बुगर्भिनि ।
 लालादिकोय नाशार्थं सविषाः सुगन्धद्वयात् ॥
 अथद्वौ सावयेद्दंशान् ह्रिद्रा गुडमाचिकैः ।
 शतघौताज्यपिचवस्तौ खीपाश्च शीतलाः ॥

Aṣṭaṅga Hṛdaya Saṁhitā, I. xxvi.

¹ History of Hindu Chemistry, Introduction P. lxviii,

² See Page 213-9.

8 AND 14. FINGERS AND NAILS.

The uses of surgeon's fingers and nails in surgical operations has been described before¹.

9,10 AND 11. LEAVES.

Rough leaves such as those of Fig trees (*Ficus Indicus*), Goji (*Elephantopus Scaber*), Śephālikā (*Nyctanthes Arbor-tristis*) and Śaka (*Tectonia Grandis*) are recommended for scarifying abscesses if they do not heal up after repeated opening by the knife. If there is any formation of pus in the mouth or eyelids, it may be evacuated with these leaves (*Susruta*)². These leaves are also to be used for bleeding the gums in gingivitis.

To cover the wounds, *Suśruta* gives a list of leaves to be used according to the nature of the wound and season of the year³ :—

For air-deranged wounds;—use leaves of Eraṇḍa (*Ricinus Communis*), Bhūrjapatra (*Betula Bhojpatra*), Pūtika (*Caesalpinia Bonducella*) and Haridrā (*Curcuma Longa*).

¹ See Page 199-202, and 204-5.

² संशोध्योभयतः कार्यं शिरस्योप कुशे तथा ।
काकोदुम्बरिका गोजीपत्रेर्विस्त्रावयेदसृक् ॥

Suśrutā Samhitā, IV. xxii.

³ एरण्ड भूर्जपूतीक हरिद्राणान् वातजे ।
पत्रमाश्रयन् यच्च काष्मरी पत्रमेव च ॥
पत्राणि चौरवृक्षाणामौदकानि तथैव च ।
द्रुषिते रक्तपित्ताभ्यां त्रणे दद्याद्विचक्षणः ॥
पाठामूर्ज्यागुडूचीनां काकमाचीहरिद्रयोः ।
पत्रञ्च शुक्लनाशया योजयेत् कफजे त्रणे ॥

Ibid, IV. i.

For bile or blood-deranged wounds;—use leaves of *Āśvabala* (*Basella Rubra*), *Kāśmarīpatra*, (*Gmelina Arborea*), *Vata* (*Ficus Bengalensis*) and *Kumuda* (*Nymphae Lotus*).

For phlegm-deranged wounds—use leaves of *Pāṭhā* (*Cisampelos Hexandra*), *Mūrvā* (*Sansevieria Zeylanica*), *Guḍuḥī* (*Tinospora Cordifolia*), *Kākamācī* (*Solanum Nigrum*), *Haridrā* (*Curcuma Longa*) and *Śuknāśā* (*Oroxylum Indicum*).

For similar purpose *Caraka*¹ recommends us to use the leaves of *Kadamva* (*Anthocephalus Cadamba*), *Arjuna* (*Terminalia Arjuna*), *Nimva* (*Azadirachta Indica*), *Pāṭali*, *Pippala* (*Ficus Religiosa*) and *Arka* (*Calotropis Gigantea*).

The leaves of the *padma* or *nymphae* are to be used for handling the eyeballs and the intestines, to replace them in their proper position when prolapsed by injury² (*Suśruta*) *Caraka* recommends lotus leaves and plantain leaves as coverings to the bleeding piles,³ *Cakradatta*⁴ mentions the use of

¹ कदम्बार्युननिम्बानां पाटल्याः पिप्पलस्य च ।

व्रण प्राच्छादने विद्वान् पत्राण्यर्कस्य चादिशेत् ॥

Caraka Samhitā, VI. xiii.

² भिन्नं नेत्रमकर्ण्यमभिन्नं लम्बते तु यत् ।

तन्निवेश्य यथास्थानमव्याविद्धशिरं शनैः ।

पीडयेत् पाणिना सन्यक् पद्मपत्रान्तरेण तु ॥

Suśruta Samhitā, IV. ii.

³ कदलीदलेरभिनवैः पुष्कर पत्रैश्च शीतजलसिक्तैः ।

प्रच्छादनं सुकुम्भुडुरिष्टं पद्मोत्पलदलेष्व ॥

Caraka Samhitā, VI. ix.

⁴ गोजीशेफालिका पत्रैरर्शः संलिख्य लिपयेत् ।

चारिण वाक्शतं तिष्ठेद् यन्महारं पिपाय च ॥

Cakradatta, Arśa Cikitsā.

Goji and Śephālikā leaves for scratching the piles before the application of caustics to them. He also directs us to rub the small tumours with the rough leaves before the application of various ointments.¹ Śivodāsa also mentions the use of such leaves for rubbing the eyelids in the pillva disease.² Suśruta³ mentions the use of rough leaves for scratching any part.

Paul⁴ mentions the use of fig leaves, for rubbing down the hard granulations of granular lids.

12. YOUNG STEMS OF PLANTS.

The young shoots are described to have served the purpose of a probe. Caraka⁵ calls them the soft variety, the metallic ones being called the hard probes. These shoots are to be used for superficial sinuses. Suśruta directs us to use the young shoots

- ¹ विष्टथ्य चोडुस्वरशाकगोजी-
पत्रेभ्यः चोदयुतैः प्रलिख्येत् ।

Cakradatta, Granthyarvuda Cikitsā.

- ² वर्त्मावलीख' बहुशस्तद्वच्छोणितमोक्षणम् ।
पुनः पुनर्विरेकञ्च पित्त्रोगातुरो भजेत् ॥

Cakradatta, Netraroga Cikitsā.

- वर्त्मावलीखमिति । कर्कशशोखाटकादि पट्टेण वर्त्मचर्षणम् ।

Tattva Candrikā. Ibid.

- ³ चीम' झोत' पितु' फेन' यावत्क' ससैन्धव' ।
कर्कशानि च पत्राणि लिखनार्थे प्रदापयेत् ॥

Suśruta Saṁhitā. IV, i.

⁴ Paul, III. xxii.

⁵ See foot-note 4. P. 269.

of the pot-herbs called Cuñca and Upādikā (*Basella Rubra*) as probes in sinuses on the eyelids and around the anus.¹

If in young people the teeth become loose as the result of some injury, the patient should be directed to live upon milk only, sucking it through the stalk of lily; and thus affording the teeth rest and a chance of being firmly fixed again.²

To excite emesis, Śārṅgadharma,³ advises us to introduce a tube of *Eraṇḍa* (*Ricinus Communis*) into the throat of the patient. The vomiting is also said to have been excited by thrusting a finger or a stalk of lily down the throat.

- 1 नाडी व्रणान् शल्यगर्भानुन्मास्युत्सङ्गिनः शनैः ।
 करिरवालांगुलिभिरिषखा वैषयेक्षिषक् ॥
 नेचवत्सर्गुदाभ्यासनाड्योऽवक्त्राः शशोणिताः ।
 चुक्षुपोदकजेः श्लेष्मः करीरैरेषयेत्सुताः ॥

Suśruta Saṁhitā, IV. i.

अभग्रांसलितान्दन्तान् सरक्तावपीडयेत् ।
 तरुणस्य मनुष्यस्य शीतैरालिपयेद्वट्टिः ॥
 सिक्ताम्बुभिस्ततः शितैः सन्धानीयैरुपाचरेत् ।
 उत्पलस्य च नालिन चौरपानं विधीयते ॥

Suśruta Saṁhitā, IV. iii.

अजीर्णं कोष्णपानीयं सिन्धु पीत्वा वमेत् सुधोः ।
 वसनं पाययित्वा च जानुमात्रासने स्थितम् ॥
 कण्ठमेरुखनालिर्न स्पृशन् वामयेक्षिषक् ।
 ललाटं वमतः पुंसः पार्श्वौ द्वौ च प्रवोचयेत् ॥

Śārṅgadharma Saṁgraha, III. iii.

CHAPTER VIII.

HYGIENIC APPLIANCES AND HOSPITAL REQUISITIES.

TOOTH-BRUSH.

The ancient Hindus used branches of trees as tooth-brush. They should have the length of twelve *āṅguli* and the circumference equal to that of the little finger. *Suśruta* directs us to use a straight and plain branch of such trees as have an astringent, or sweet, or bitter, or sour taste¹. Amongst these classes of trees, the twigs of *Khadira* (*Acacia Catechu*), *Madhuka* (*Brassia Latifolia*), *Nimba* (*Melia Azadirachta*), *Karñja* (*Pongamia Glabra*) are the best. The end of the stick is to be chewed first to form a brush and the teeth are then to be rubbed with it. He recommends us to use some tooth-powder.²

- ¹ तत्रादौ दन्तपवन द्वादशाङ्गुल मायतं ।
कनिष्ठिका परिणाह सञ्चययितमग्नयं ॥
अयुष्मयन्ति यच्चापि प्रत्ययं शस्तभूमिजं ।
अवेक्ष्यत्तुं च दोषश्च रसं वीर्यं च योजयेत् ॥
कषायं मधुरं तिक्तं कटुकं प्रातस्त्यितं ।
निम्बश्च तिक्तके श्रेष्ठः कषाये खदिरस्तथा ।
मधुको मधुरे श्रेष्ठः करञ्जः कटुके तथा ॥

Suśruta Saṁhitā, IV. xxiv

- ² चूड्र ल्योष त्रिवर्गाङ्गं सतैलं सैन्धवेन च ।
चूर्णेन तेजोबल्याश्च दन्तान्निव्यं विशोधयेत् ॥
एकैकं वर्षयेद्दन्तं मृदुना कूर्चकेन च ।
दन्तशीघ्रं चूर्णेन दन्तमांसस्यवाधयन् ॥

Ibid,

Bhāvamiśra mentions the names of other trees which may be used for the purpose,¹ and also gives us a list of trees to be avoided.² The use of the tooth-brush is contra-indicated in the various diseases of the mouth, ears, &c.³ Caraka⁴ advises us to use the tooth-brush twice a day.

- १ अङ्गं वीर्यं वटे दीतिः करञ्जं विजयो भवेत् ॥
 प्लक्षे चैवार्थसम्पत्तिर्वदर्थ्या मधुरोध्वनिः ।
 खदिरं सुखसौगन्ध्यं विस्वेतु विपुलं धनम् ॥
 उदुम्बरे तु वाक्सिद्धिरान्तेत्यारोग्यमेव च ।
 कदम्बे तु धृतिर्मेधा चम्पके च हृदामतिः ॥
 शिरीषे कौत्सिमौभाग्यं मायुरारोग्यमेव च ।
 अपामार्गे धृतिर्मेधा प्रज्ञाशक्तिस्तथाश्वनिः ॥
 दाडिम्यां सुन्दराकारः ककुभे कुटजे तथा ।
 जातीतगरमन्दरैर्दुःस्वप्नश्च विनश्यति ॥

Bhāva Prakāśa, I. i.

- २ गुवाकस्तालहिमाली केतकश्च बृहत्सृण ।
 खर्जूरं नारिकेरश्च सवैते लणराजकाः ॥
 लणराजं समुत्पन्नं यः कुर्याद् दन्तधावनम् ।
 नरञ्चाण्डाल योनिः स्यादयावद्दङ्गान्न पश्यति ॥

Ibid.

- ३ नखादिदृगलतालीष्ट जिह्वारोगं समुद्भवै ॥
 अधास्यपाकिं श्वासीच कासहिक्का वमीषु च ।
 दुर्व्यलो जीर्णं भक्तश्च मूर्च्छार्त्तमिदपीडितः ॥
 शिरोरुगार्त्तसृष्टितः श्रान्तः पानक्लमान्वितः ।
 अर्द्धितौ कर्णशूलौच दन्तरोगोच मानवः ॥

Suśruta Saṁhitā, IV. xxiv

- ४ आपोयितायं द्वौ कालौ कषायं कटुतिक्तकम् ।
 भक्षयेद्दन्तपवनं दन्तमांसान्यवाधयन् ॥
 निहन्ति गन्धवैरस्यं जिह्वादन्तास्रजं मलम् ।
 निष्कृष्य रुचिमाधत्ते सद्यो दन्तविशोधनम् ॥

Caraka Saṁhitā, I. v.

Suśruta mentions the use of a tooth-brush to extract a fish-bone from the throat.¹

After cleansing the mouth with water after meals, I'Tsing ordains² "Chew tooth-wood in the mouth; let the tongue as well as the teeth be carefully cleaned and purified." Again he says: "It is surely not seemly for any one to spend his time after meals chaffing and chattering, nor is it right to remain impure and guilty all day and night, without preparing water in a clean jar or without chewing a tooth-wood."

He continues³: "Every morning one must chew tooth-woods, and clean the teeth with them, and rub off the dirt of the tongue as carefully as possible. Only after the hands have been washed and the mouth cleansed is a man fit to make a salutation; if not, both the saluter and the saluted are at fault. Tooth-wood is *Danta-kāṣṭha* in Sanskrit—*danta*, tooth; and *kāṣṭha*, a piece of wood. It is made about twelve finger-breadths in length, and even the shortest is not less than eight finger-breadths long. Its size is like the little finger. Chew softly one of its ends, and clean the teeth with it. If one unavoidably come near a superior, while chewing the woods, one should cover the mouth with the left hand.

Then breaking the wood, and bending it, rub the tongue. In addition to the tooth-wood, some tooth-picks made of iron or copper may be used or a small stick of bamboo or wood, flat as the surface of the little finger and sharpened on one

¹ मृदुना वा दन्तधावनकुञ्चकेनापहरेत् ।

Suśruta Saṁhitā, I. xxvii.

² I'Tsing. Records of the Buddhist Religion.—Takakusu. P. 26-7.

³ Ibid. ch. viii. Use of Tooth-woods. P. 33.

end, may be used for cleaning the teeth and tongue ; one must be careful not to hurt the mouth. When used, the wood must be washed and thrown away.

Whenever a tooth-wood is destroyed, or water, or saliva is spit out, it should be done after having made three fillips with the fingers or after having coughed more than twice ; if not, one is faulty in throwing it away. A stick taken out of a large piece of wood, or from a small stem of a tree or a branch of an elm, or a creeper, if in the forest ; if in a field, of the paper mulberry, a peach, a sophora japonica (Huai), willow tree, or anything at disposal, must be prepared sufficiently beforehand. The freshly cut sticks (lit. wet ones) must be offered to others, while the dry ones are retained for one's own use.

The younger priest can chew as he likes, but the elders must have the stick hammered at one end *and made soft* ; the best is one which is bitter, astringent or pungent in taste, or one which becomes like cotton when chewed. The rough root of the Northern Burr-weed (Hu Tai) is the most excellent ; this is otherwise called Tsâng-urh or Tsae-urh, and strikes the root about two inches in the ground. It hardens the teeth, scents the mouth, helps to digest food, or relieves heart-burning. If this kind of tooth-cleaner be used, the smell of the mouth will go off after a fortnight. A disease in the canine teeth or toothache will be cured after a month. Be careful to chew fully and polish the teeth cleanly, and to let all the mouth-water come out ; and then to rinse abundantly with water. That is the way. Take in the water from the nose once. This is the means of securing a long life adopted by Bodhisattva *Nāgārguna*. If this be too hard to put in practice, to drink water is

also good. When a man gets used to these practices he is less attacked by sickness. The dirt at the roots of the teeth hardened by time must all be cleaned away. Washed with warm water, the teeth will be freed from the dirt for the whole of life. Tooth-ache is very rare in India owing to their chewing the tooth-wood."

TOOTH-PICK.

Suśruta advises us to use sticks of grass as tooth-pick after meals to extract particles of food lodged between the teeth, otherwise these will decompose and the mouth would be smelling badly.¹ Bhāvamiśra gives similar directions but adds that if any particles of food cannot be easily extracted by the tooth-pick, one must not use any force to extract them.² "After eating they cleanse their teeth with a wilow stick, and wash their hands and mouth."³

JIHVĀ NIRLEKHANA OR TONGUE SCRAPER.

Suśruta says: "To scrape the tongue, a golden, or silver, or

¹ दन्तान्तरगतं चान्नं शोधनेनाहरेच्छनैः ।

कुर्व्यादनाहृतं तद्धि मुखस्यानिष्टगन्धतां ॥

Suśruta Samhitā, I. xlvī.

² एवं भूक्षा ममाचामिद्रूक्षयहण पूर्व्वकम् ।

भोजने दन्तलग्नानि निर्हृत्याचमनं चरेत् ॥

दन्तान्तरगतं चान्नं शोधनेनाहरेत् शनैः ।

कुर्व्यादनिर्हृतं तद्धि मुखस्यानिष्ट गन्धताम् ॥

दन्तलग्नमनिर्हृत्यं लेपं मन्थेत* दन्तवत् ।

न तत्र बहुशः कुर्व्याद् यत्र निर्हरणं प्रति ॥

Bhava Prakasa, I. i.

³ Beal's Records of the Buddhist Religion. Trans. from Hiuēn Tsiang, vol. I, p. 77.

wooden scraper is to be used. It should be ten anguli long and must be pliant and polished"¹. Caraka² mentions tongue-scraper of copper, lead or brass. Bhāvamisra³ also gives a similar description. It is to be used for scraping the deposit on the tongue. It is still commonly used in India.

RAZOR AND SHEARS. THE PRACTICE OF SHAVING.

Every one is recommended by Suśruta to have his beard shaved, hair trimmed and nails pared.⁴ Caraka⁵ also advises

- ¹ जिह्वानिलेखनं रौप्यं सौवर्णं वार्चमेव च ।
तन्मलापहरं शस्तं शृङ्गुलं दशाङ्गुलं ॥

Suśruta Samhitā, IV, xxiv.

- ² सुवर्णरूप्यताम्बाणि त्रपुरीतिमयानि च ।
जिह्वानिलेखनानि स्युरतीत्यान्यदृज्जुनि च ॥
जिह्वासूलगतं यच्च मलमुच्छ्वासरोधि च ।
सौगन्धं भजते तेन तस्माज्जिह्वां विनिलिखेत् ॥

Caraka Samhitā, I, v.

- ³ जिह्वानिलेखनं ह्रिभं राजतं ताम्रजं तथा ॥
पाटितं शृङ्गु तत् काष्ठं शृङ्गुपत्रमथ तथा ।
“तत्काष्ठं” दन्तशोधनयोग्यं काष्ठम् ।
दशाङ्गुलं शृङ्गु स्निग्धं तेन जिह्वां लिखेत् सुखम् ।
तज्जिह्वा मलवैरस्य दुर्गन्धं जड़ता हरम् ॥

Bhāva Prakāśa, I, i.

- ⁴ पापोपशमनं केशनखरोमापमार्जनं ॥
हर्षलाघव-सौभाग्य-करमुत्साह वर्द्धनं ।
वाणवारं सजावर्णं तेजोबलं विवर्द्धनं ॥

Suśruta Samhitā, IV, xxiv.

तत्रादित एव नीचनखरोमा * *

Ibid.

- ⁵ पौष्टिकं हृष्यमायुष्यं शुचिरूपविराजनम् ।
केशश्मश्रुनखादीनां कल्पनं संप्रसाधनम् ॥

Caraka Samhitā, I, v.

us to shave regularly, that is thrice in a fortnight.¹ Bhāvamīśra says that this practice conduces to health, beauty, longevity and purity, and should be observed every fifth day². Razor is mentioned in the R̥gveda³ and in the Kāthopaniṣad of the White Yāyū.⁴ In the Śatapatha Brāhmaṇa, we find the method of shaving well described.⁵ “Then (in shaving) are used a porcupine quill spotted in three places and a copper razor; that three-spotted porcupine’s quill resembles the three-fold science and the copper razor resembles the Brāhmaṇa; for Brahṁā is fire, and fire is of reddish (lohita) colour, hence a copper (loha), razor is used”.

Again we read⁶ :—“For impure, indeed, is that part of man where water does not reach him. Now at the hair and beard, and at the nails the water does not reach him; hence when he shaves his hair and beard, and cuts his nails, he does so in order that he may be consecrated after becoming pure.

¹ विः पचस्य केशश्मश्रुलीमनखान् संहारयेत् ।

Carakas Saṁhitā, I. viii.

² पञ्चरात्राख्यं श्मश्रुकेशरोमाणि कर्त्तयेत् ।
केशश्मश्रु नखादीनां कर्त्तनं सम्यसाधनम् ।
पीलिकं धन्यमायुष्यं शौचकान्तिकरं परम् ॥
“सम्यसाधनम्” शोभाजनकम् ॥

Bhāva Prakāśa, I. i.

³ सं नः शिश्रीहि सुरिजोरिव चुरंराखरायो विमोचन् ।

R̥gveda, 8 M. 4 S. 5 A. 7 A. 16 V.

⁴ चूरस्य धारा निश्चिता दुरव्यय दुर्गम्यस्तन् कवयो वदन्ति ।

Kāthopaniṣad, I. iii.

⁵ Śatapatha Brāhmaṇa, II. 6. 4. 5.

⁶ Ibid. 111. 1.2.2.

3. Now some shave themselves all over, in order that they may be consecrated after becoming pure all over; but let him not do this. For even by shaving the hair of his head and his beard, and by cutting his nails he becomes pure; let him therefore shave only the hair of his head and his beard, and cut his nails.

4. In the first place he cuts his nails, first of the right hand, for in human (practice) those of the left hand (are cut) first, but with the gods in this manner. First he cuts those of the thumb—for in human practice those of the little fingers are cut first, but with the gods in this manner.

5. He first passes (the comb) through his right whisker—for in human (practice they comb) first the left whisker, but with the gods in this manner.

6. His right whisker he moistens first with the text “may this divine water be propitious unto me”.....

There upon he lays a stalk of sacrificial grass on (the hair of the whisker) with the text “O plant, protect me”..... Thereto he applies the razor, with the text “O knife, injure him not”.

8. Having cut off (part of the stalk and hair), he throws it into the vessel of water. Silently he moistens the left whisker; silently he lays the stalk of grass on it; and having silently applied the razor thereto and cut through (it and the hair) he throws them into the vessel of water.

He then hands the razor to the barber, and the latter shaves off the hair and beard. When he has shaved the hair and beard.....

10. He bathes.....

12. He steps out (from the water) towards the north-east, with the text "cleansed and pure I go forth from them;".....

13. He then puts on (a linen) garment etc."

"The Atharva-veda relates how, when the ceremony of shaving off his beard was performed on king Soma, Vāyu brought the hot water and Savitrī skillfully wielded the razor."¹

In para. 3, quoted above, we have evidence of the practice of depilation of the pubes which is here forbidden. There are six important rules and six minor rules of ordination for the female members or Śramāṇeris of the Buddhist order. One of the six minor rules is: A female must not shave the hair in any place but the head.² "Aristophanes, a contemporary of Hippocrates,³ Persius⁴ and Juvenal⁵ refers to the depilation of the pubes as being common among certain classes, and the early Christian Fathers deplore the practice. See also the remarks of Senonius on the conduct of Domitian"⁶. Prosper Alpinus (16th century) "found the custom still prevalent among the Egyptian women"⁷. "The custom survived in France, and Italy in the 16th century"⁸.

KEŚA PRASĀDHANĪ OR COMB.

Suśruta directs us to comb the hair to free the head from dust,

¹ Macdonnell's Sanskrit Literature, p. 164.

² See I'Tsing, P. 97, Foot-note 3. Vinaya Saṅgraha. Chap. xii.

³ Hippocrates, Ran. 516, Lys 89, 151.

⁴ Persius, iv. 37.

⁵ Juvenal, vii. 114.

⁶ Senonius, xxii.

⁷ Medicina Aegyptiorum, lll. xv.

⁸ Milne, Surgical Instruments &c., p. 90-91.

louse and dandruff.¹ Bhāvamiśra advises us to comb the hair every day to keep it clean, as it stimulates the growth of hair.² Caraka³ also recommends us to keep the hairs clean. The practice of combing the hair is very ancient; the Atharva-veda mentions a comb with a hundred teeth.

LOOKING-GLASS:

The looking-glass should be constantly used as thereby the complexion is said to be improved and life prolonged⁴. For an account of the looking-glass of the ancient Hindus, see Mitra's Indo-Aryans⁵.

DRESS.

Silk, chintz and red clothes are good for the winter, for they are said to be useful for derangement of air and phlegm. Thin silk is cooling and is efficacious for biliary disorders; so it should be used during the summer. It should be coloured twany or red. White clothes are auspicious and are neither hot

¹ केशप्रसाधनी केश्या रजोजन्तु मलापह्ना ।

Suśruttā Saṁhitā, IV. xxiv.

² केशपाशे प्रकुञ्चीति प्रसाधन्या प्रसाधनम् ।

केश प्रसाधनं केश्य' रजोजन्तु मलापह्ना ॥

Bhāva Prakāśa, I. i.

³ साधुवैशः प्रसाधितकेशो * *

Caraka Saṁhitā, I. viii.

⁴ आदर्शालोकनं प्रोक्तं साङ्गल्य' कान्तिकारणम् ।

पौष्टिकं बल्यसायुष्यं पापलक्ष्मी विनाशनम् ॥

Bhāva Prakāśa, I. i.

⁵ The Indo-Aryans Vol. I, p. 240,

nor cold; therefore they should be worn during the rains¹. Caraka says that pure dress conduces to longevity, happiness and fortune².

UṢNĪṢA OR HEAD DRESS.

Suśruta³ advises us to use a cap on our head which is thus protected from injury. Bhāvamīśra says that the habitual use of some form of covering for the head stimulates the growth of hair, increases beauty of the head and protects it from dust, draughts and accumulation of phlegm. Only light caps should be used as the heavy varieties derange bile and cause diseases of the eyes.⁴ For the diagrams of the various forms of turbans used by the ancient Hindus, see Mitra's Indo-Aryans.⁵

¹ कौशेयौर्णिक वस्त्रञ्च रक्तवस्त्रन्तुयैव च ।

वातश्चे च हरन्तु शीतकाले विधारयेत् ॥

“कौशेयः” पट्टाभरं वसरवस्त्रञ्च ।

मेध्यं सुशीतम्पित्तघ्नं कषायं वस्त्रमुच्यते ।

तद्धारयेदुष्णकाले तदापि लघु शस्यते ॥

कषायङ्गीकटी इति लोके, कषाय रागरक्तं वा ।

शुक्लान् शुभदं वस्त्रं शीतातप निवारणम् ।

नचौष्णञ्चवा शीतान्तु वर्षासु धारयेत् ॥

Bhāva Prakāśa, I. i.

² काव्यं यशस्वमायुष्यमलङ्कीर्णं प्रहर्षणम् ।

शीमत् पारिवर्तं शस्त्रं निर्मलान्धारणम् ॥

Caraka Saṁhitā, I. ३.

Bhāva Prakāśa, I. i.

³ पवित्रं केशमुष्णीषं वातातपरजोऽपहं ।

Suśruta Saṁhitā, IV. xxiv.

⁴ उष्णीषं कान्तिहृत्केशं रजोवात कफापहम् ।

लघु तच्छस्यते यस्माद् गुरु पित्ताविरोधकम् ॥

Bhāva Prakāśa, I. i.

The Indo-Aryans, Vol. I, p. 220.

CHATRA OR UMBRELLAS.

Suśruta says: Umbrellas are useful for protecting men from the rains, draughts, glare of the sun, exposure to cold, and dust. They are auspicious and are beneficial to the eyes¹. Caraka² advises us to use it as it protects us from the sun, rain &c. Bhāvamiśra³ also describes its efficacy similarly. Umbrella is one of the insignia of royalty in India, and is always held over the heads of kings as shown in the Sanchi and Amarāvati sculptures⁴. It is still commonly used in India.

YAṢṬI OR STICKS.

Caraka⁵ directs us to use a stick as a support. Suśruta says: "By using sticks, a man gains in strength, prowess and manliness. He becomes courageous, patient and forbearing. He can stand erect and is not troubled by any fear"⁶. It

¹ वर्षानिलरजोवर्ध्मं द्विमादीनां निवारणं ।

वक्ष्य चक्षुष्य मौजस्यं शङ्करं कृच्छधारणं ॥

Suśruta Saṁhitā, IV. xxiv.

² ईतेर्विधमनं वक्ष्यं गुप्तावरणशङ्करम् ।

वर्ध्मानिलरजोऽम्बुघ्नं कृच्छधारणमुच्यते ॥

Caraka Saṁhitā, I. v.

³ क्वदस्य धारणं वर्षातपवात रजोऽपह्नम् ।

द्विमन्नं द्वितमच्छोषं साङ्गव्यमपि कौर्तितम् ॥

Bhāva Prakāśa, I. i.

⁴ See Indo-Aryans, I, p. 266.

⁵ खलतः संप्रतिष्ठानं श्वदुष्पाच्च निस्सदनं ।

श्वदृष्टमनसायुष्यं भयन्नं दृष्टधारणम् ॥

Caraka Saṁhitā, I. v.

⁶ यनः सरीसृपव्याल विषाणिभ्योभयापहं ।

यमखलन दोषघ्नं स्थविरेच प्रशस्यते ॥

सत्त्वोत्साहवत्सलैर्यैश्चैर्यवीर्यै विवर्द्धनम् ।

श्वदृष्टभकरश्चापि भयन्नं दृष्टधारणं ॥

Suśruta Saṁhitā, IV. xxiv.

protects a man from dogs, snakes &c. Bhāvamiśra¹ apparently quotes these verses from Suśruta.

UPĀNAHA OR SHOES.

The ancient Hindus used two kinds of shoes, made of wood and leather. The wooden pādukā is recommended to be used before and after dinner². The good effects claimed by its use are, an increase of the power of vision, strength and longevity.³ When travelling, the upānaha or leather shoes are to be used. Besides the advantages mentioned above, shoes are very comfortable to the travellers and prevent many diseases of the feet⁴. If any one often travels barefooted, he feels out of sort, his senses fail, vision becomes impaired and his expectation of life is reduced.⁵

¹ Bhāva Prakāśa, I. i.

² पादुकारोहणद्वयान् पूर्व भोजनतः परम् ।
पादरोगं हरं ह्यथ चक्षुष्यञ्चापुषी हितम् ॥

Bhāva Prakāśa, I. i.

³ चक्षुष्यं स्पर्शनहितं पादशैत्यसनापहम् ।
बल्यं पराक्रममुखं ह्यथ पादचधारणम् ॥

Caraka Samhitā, I. v.

⁴ पादरोगहरं ह्यथ रचोन्नं प्रीतिवर्द्धनं ।
सुखप्रचारमीजस्यं सदापादवधारणं ।
अनारोग्यं सनायुष्यं चक्षुषोरुपचातकत् ।
पादाभ्यामनुपानङ्गां सदा चक्रमणं नृणां ॥

Suśruta Samhitā, IV. xxiv.

⁵ उपानङ्गारणं नेत्रमायुष्यं पादरोगहत् ।
सुखप्रचारमीजस्यं ह्यथच परिकीर्तितम् ॥
पादाभ्यामनुपानङ्गां सदा चक्रमणं नृणाम् ।
अनारोग्यं सनायुष्यमिन्द्रियघ्नं महष्टिदम् ॥

Bhāva Prakāśa, I. i.

The Hindus wore sandals like the ancient Greeks. They also used boots, which look like the modern boots used by Europeans. Buddha gave the Bhikkhus permission to wear boots or shoes, with thick lining¹. Hiuen Tsiang² says that "here (Avanti) Tathagatha gave permission to the Bhikkhus to wear kih-fu-to (boots)." For an account and figures of ancient boots used by the Hindus, see Indo-Aryans.³

VYĀJANI AND CĀMARA. THE FAN.

The fan was used for airing the patients to drive away flies.⁴ Sūsruta mentions the cāmara i.e., the tail of the Thibetan yolk (*Bos grunnius*) to be used as a fan. "It soothes the inflammation of boils and also acts as a fly-brush to prevent infection of the open wound"⁵. The cāmara is also one of the insignia of royalty and as such we have many representations of it in the sculptures of ancient India⁶. For diagrams of the ancient fan, see Indo-Aryans⁷.

• Caraka directs us to use a kulā or fan to winnow corn, prepared from the kāśa (*Saccharum Spontamum*) to resuscitate a still-born child⁸.

¹ Mohāvagga, varga 13 ff 6. S. B. E. vol. xvii. p. 35.

² Beal's Records of Buddhist Religion, vol. II. p. 280.

³ Indo-Aryans, Vol. I, p. 123-6.

⁴ 'वालव्यजन मौजस्य' मलिकादीनपोहति ।

शेषदाह अमस्वेद सूक्ष्माग्नौ व्यजनानिलः ॥

Sūsruta Samhitā, IV. xxiv.

⁵ व्यज्येत वालव्यजनैर्व्रणं न च विषट्ठयेत् ।

Ibid, I. xix.

⁶ See Indo-Aryans, vol. II, p. 267-70.

⁷ For diagrams, see Indo-Aryans, vol. I, p. 263.

⁸ तथा संक्षेपविद्वान् प्राणान् पुनर्लभेत कणकपालिकायुषेण चैनमभिः निधुनीयाद्-
दधेष्टं स्यात् यावत् प्राणानां प्रत्यागमनं तत्तत्सर्वमेव कुर्वतः ॥

Caraka Samhitā, IV. viii.

Bhāvanīśra¹ mentions fans made of the following materials:—palm leaf, bamboo, yolk's tail, cloth, peacock's feather and cane. He attributes peculiar properties to each fan.

Rājavalabha says² that "the palm-leaf fan overcomes disturbances of all the three humours, and is light and agreeable; the bamboo fan causes heat and irritability, and promotes inordinate secretion of the two humours—air and bile; the cane, cloth and peacock's feather fans, overcome disturbances of the three humours; the hair fan is invigorating etc."

The Buddhist Bhikkhus used the palm-leaf fan. "Not unfrequently there is added a lotus-leaf shaped fan, made from a single frond, with an edging of bamboo or light wood, and furnished with a handle fashioned like the letter "S". The palm from which the leaf is taken, is also that used for the mss., namely the Talipot; hence the name Talponi given to the Bhikkhus by the early Portuguese adventurers in Burma. When he attended a meeting at which women are likely to be present, every Bhikkhu must have the fan."³

¹ मयजनस्थानिहो दाह रवेदमूर्च्छा यसापहः ।
तालवृक्षमधो वातस्त्रिदोषशमको मतः ॥
वंशव्यजनजस्तूणी रक्तपित्तप्रकोपणः ।
चासरी वस्त्रसम्भूतो मादूरी वेतजस्तथा ॥
एते दोषजिता वाताः स्निग्धा ह्रद्याः सपूजिताः ।

Bhūva Prakāśa, I. i.

² तालव्यजनगुणः—त्रिदोषशमनत्वम् । लघुत्वञ्च ॥ वंशव्यजनगुणः—रुचत्वम् ।
सञ्चत्वम् । वायुपित्तकारित्वञ्च ॥ वेतवस्त्रमयूरपुच्छव्यजनगुणः—त्रिदोषनाशित्वम् ।
चासव्यजनगुणः—तेजस्कृत्वम् । सचिकादि निवारकत्वञ्च ।

Rājavalabha.

³ The Way of Buddha, p. 53-54.

FILTERS.

Filters were used by the Hindus and are recommended to be made of an earthen or metallic vessel, the mouth being closed by a piece of cloth tied round its neck.

If the water be filthy, Suśruta¹ advises us to purify it by boiling it or by exposure to the sun; or by throwing hot iron balls, sand or clay balls into the water and then allowing it to cool. Such purified water should be scented with the flowers of Nāgakeśara (Mesua Ferrea), Campaka (Michelia Champaca), Utpala (Nymphaea Stellata) and Patala (Bignonia Snavaeolens).

Suśruta mentions seven means of purifying polluted water², viz.,

1. Kataka phala or nirmālaya or seeds of Strychnos Potatorum.
2. Gomedaka or a kind of gems.
3. Viṣagranthi, or root of Nelumbium Speciosum.
4. Śaivalāmūla or root of Vallisneria Spiralis.
5. A piece of cloth.
6. Pearls.
7. Precious Stones and crystals.

¹ व्यापन्नानामग्रिकथनं सूर्यातपप्रतापनं तत्रायःपिण्डसिकतालोद्भाषां वा निर्व्यापनं प्रसादनञ्च कर्त्तव्यं नागचम्पकोत्पलपाटलापुष्पप्रभृतिभिश्चाधिवासनमिति ।

Suśruta Samhitā, I. xlv.

² तत्र सप्तकलुषस्य प्रसाधनानि भवन्ति । तद्यथा । कतकगोमिदकविषग्रन्थिशेवालमूल-
वस्त्राणि सुकामण्येति । पञ्चनिक्षेपणानिभवन्ति । तद्यथा । फलकं त्राष्टकं मुञ्जवलय
उदकमक्षिकाशिक्येति । सप्तशैतिकरणानि भवन्ति । प्रवातस्थापनमुद्गप्रक्षेपणं यष्टिका-
भामण्यं व्यजनं वस्त्रोद्धारणं बालुका प्रक्षेपणं शिक्वावलम्बनञ्चेति ।

He mentions five kinds of means for preventing contact of the water vessel with the earth¹ :—

1. Phalaka or planks as of Śālmali wood.
2. Tryastaka or octogonal tripod of wood.
3. Muñjvalaya or circular pad of Saccharine Muñja.
4. Udakamañcikā or a raised framework of cane and bamboo.
5. Śikya or a loop suspended by three strings.

He mentions seven ways of cooling water :—

1. Exposure to air.
2. Sprinkling water on the vessel.
3. Stirring the water with a rod.
4. Fanning the water.
5. Filtration through cotton fabrics.
6. Putting the vessel of water on a sand bed.
7. Suspension of the vessel in a loop.

He advises us to use rain water filtered through a broad piece of white and clean cloth². In collecting water from the rivers and ponds, the Hindu females still use a kalasī or earthen vessel, the mouth being closed by a piece of cloth.

¹ In the English translations of the *Suśruta Saṁhitā*, *Bibliotheca Indica*, Dr. Cattopādhāya translates the passage incorrectly. He misunderstood the terms phalaka, &c. to be remedial agents, necessary in the prorification of water.

² गार्ह पुनः प्रधानं तदुपाददीताश्चयुजे सासि शुचिशुक्लवित तपटैकदेशच्युतमथ वा हर्षातलपरिषष्टमन्त्रैर्वा शुचिभिर्माजनेर्गृहीतं ।

Suśruta¹ deprecates impure water as injurious to the human system and advises us not to drink or bathe in such water as there is always the risk of being speedily affected with many diseases.

"It (filter) forms one of the eight sacred utensils necessary for a sramana of the Buddhist order. It is a strainer or water-dipper—an apparatus for filtering the water which he drinks, so that he may not, even unwillingly, take animal life"².

One of the six requisites of a Bhikṣu is Parisrāvana, a water-strainer³.

WATER VESSEL.

To store water, Suśruta mentions vessels of gold, or silver, or earth⁴.

"The clean water is kept separately from water for cleansing purposes (*lit.* 'touched' water), and there are two kinds of jars (*i.e.* kundi and kalasa) for each. Earthenware or porcelain is used for the clean jar, and the jar, for water for cleansing purposes (*lit.* 'touched water') is made of copper or iron. The clean water is ready for drinking at any time, and the 'touched' water for cleansing purposes after having been to the urinal.

¹ व्यापन्नं वर्जयेन्नित्यं तोयं दृष्टव्यमनामैव ।

दोषसञ्जनं, छिन्नं तन्नाददीताहितं तु तत् ॥

व्यापन्नं सखितं यस्य पिवतीहा प्रसाधितं ।

अथयुः पाण्डुरोगश्च त्वन्दोषमविपाकतां ॥

आसकासप्रतिश्यायशूलगुल्मीदरानि च ।

अन्यान् वा विषमान् रोगान् प्राप्नुयात् क्षिप्रमेव च ॥

Suśruta Saṃhitā, I. xlv.

² The way of Buddha, p. 53.

³ I'Tsing, ch. x.

⁴ सौवर्के राजने मृन्मये वा पात्रे निदध्यात् तत्साल्वकालमुपयुञ्जीत तस्यालामि भौमम् ।

Ibid.

The clean jar must be carried in a clean hand, and be placed in a clean place, while the jar for the 'touched' water should be grasped by the 'touched' (or 'unclean') hand and be put in an unclean (or 'touched') place. The water in a pure and fresh jar can be drunk at anytime; the water in any other jar is called 'special water' (more *lit.* seasonable water *i.e.* water to be used at certain prescribed times, probably *kālodaka*)."¹

BATHING.

The Hindus in their daily life do not eat without having first washed themselves in a bath. They always use a bathing-sheet and this ancient practice is still followed.

Bhāvamiśra says² : "Bathing stimulates the appetite, virile power and strength, prolongs life, allays thirst and burning sensation, cures eczema, and washes out dirt and perspiration."

Besides the ordinary bath, there is some evidence of the use of a medical bath to cure diseases. I'Tsing says³ : "The World-honoured One taught how to build a bath room, to construct a brick pond in an open place, and to make a medical bath in order to cure a disease. Sometimes he ordained the

¹ I'Tsing, ch. vi.

² दीपनं वृष्यमायुष्यं स्नानं भोजी बलप्रदं ।
 कण्डुमलयमःस्वेदतन्द्रा लङ्घ्वाह पापनुत् ॥
 बाह्यैश्च सेकेः शीताद्यै रूक्षान्तर्गतिं पीडितः ।
 नरस्य स्नातमात्रस्य दीप्यते तेन पावकः ॥
 शीतेन पयसा स्नातं रक्तपित्तप्रशान्तिहृत् ।
 तदेवौषेन तीथेन वल्ल्यं वातकफापहम् ॥
 शिरः स्नानमचक्षुष्य मल्युषेनाम्बुना सदा ।
 वातश्चैव प्रकीर्षेतु हितन्तश्च प्रकीर्तितम् ॥

Bhāva Prakāśa, I. i.

³ I'Tsing, ch. xx.

whole body to be anointed with oil, sometimes the feet to be rubbed with oil every night, or the head every morning ; for such a practice is very good for maintaining clear eyesight and keeping off the cold." "Bathing should always take place when one is hungry. Two kinds of benefits are derived from having meals after bathing. First, the body is pure and empty being free from all dirt, second, the food will be well digested as the bathing makes one free from phlegm or any disease of the internal organs. Bathing after a good meal is forbidden in the 'Science of Medicine' " (Kikitsā-Vidyā).

DRINKING VESSEL.

Scented water is advised to be drunk out of cups made of gold, or silver, or copper, or bell-metal, or lapis lazuli or earthenware. Bhāvamiśra² also mentions cups of the same materials.

"To drink from a jar holding it upright in front is no fault but drinking in the afternoon is not permissible. A jar may be made to fit one's mouth ; the top of the cover should be two fingers high ; in it a hole as small as a copper chopstick may be made.

Fresh water for drinking must be kept in such a jar. On the side of the jar there is another round hole as large as a small coin, two fingers higher than the drinking-mouth. This hole is used for pouring in water ; two or three gallons may be put in it. A small jar is never used.

¹ See foot-note 2, P. 65.

² जलपावन्तु तास्य तदभावे नृदोहितम् ।
पवित्रं शीतलं पात्रं गठितं स्फटिकेन यत् ॥
काचिन रचितमवसथा वैदूर्यं सम्यगम् ।

If one fear that insects or dust may enter in, both the mouth and the hole may be covered by means of bamboo, wood, linen, or leaves. There are some Indian priests who make jars according to this style. In taking water the inside of the jar must be first washed in order to get off any dirt or dust, and then fresh water must be poured in.

A priest who travels, carries his jars, bowl, necessary clothes, by hanging them from shoulders over his cloak, taking an umbrella in his hand. This is the manner of the Buddhist priests in travelling¹."

DINNER SERVICE.

Suśruta² advises us to use different kinds of vessels for distributing the various kinds of food :—

Iron vessels for ghee or clarified butter.

Silver vessels for drinks, soups and gruels.

¹ I'Tsing, ch. vi.

² घृतं कार्णप्रायसे दीयं पेया दियातु राजते ॥

फलानि सर्वभक्ष्यांश्च प्रदद्याद्देहलेषु च ।

परिशुष्कप्रदिग्धानि सौवर्णेषु प्रकल्पयेत् ॥

प्रद्रवाणि रसांश्चैव राजतेषूपहारयेत् ।

कटूराणि खडांश्चैव सम्भान् श्लेष्मिण्यु दापयेत् ॥

दद्यात्ताम्रमये पात्रे सुशीतं सुमृतं पयः ।

पानीयं पानकं मद्यं सन्मयेषु प्रदापयेत् ॥

काचस्फटिकपात्रेषु शीतलेषु शुभेषु च ।

दद्याद्द्रव्यपात्रेषु रागषाडवसङ्कान् ॥

पुरस्ताद्विमले पात्रे सुविस्तीर्णे मनोरमे ।

सुदः सुपीदनं दद्यात् प्रदेहांश्च सुसंस्कृतान् ॥

Plantain leaf vessels for fruits and sweetmeats.

Gold vessels for flesh.

Stone vessels for whey.

Copper vessels for milk.

Earthen vessels for water, sherbets and wines.

Glass, crystal, lapis lazuli vessels for rājsāḍava and saṭṭaka.

In the *Bhāva Prakāśa*¹ we have a detailed description on the subject—"A dinner service of gold is the best from a medicinal point of view, and it is supposed to be the best tonic for the eye. Eating out of silver is equally efficacious for promoting hepatic functions. A service of zinc improves the intelligence and appetite. Food served in brass utensils promotes wind and heat, but cures phlegmatic disorders and expells worms. The use of steel or glass vessel cures chlorosis, jaundice and intumescence. A stone or clay service brings on poverty. Wooden plates are good appetisers, but help the secretions of phlegmatic humour. The use of certain leaves as plates acts as an antidote against poisons. When at dinner, a water jug with a cup should be placed on the right hand. A copper vessel is the best for the purpose. The next best is an earthen pot. Vessels made of crystal and lapis lazuli are also pure and cooling".²

¹ आयसी काचपात्रे च भोजनं सिद्धिकारकम् ।

शोथ पाण्डुरहरं वल्यं कामलापहमुत्तमम् ।

शैलेयि सृण्वये पात्रे भोजनं त्रीनिवारणम् ।

दारुद्रवे विशिषिण रुचिदंष्ट्रं भकारितु ।

पात्रं पत्रमयं रुच्यं दीपनं विषपापनुत् ॥

SPOONS.

I'Tsing says¹ : "As to the mode of eating in the West, they use only the right hand, but if one has had an illness or has some other reason, one is permitted to keep a spoon for use."

SPITTOONS.

Spittoons were commonly used by the ancient Hindus, and Caraka² mentions it as one of the things necessary for the sick room. It is also mentioned in the Mohāvagga³: "And the sethe's wife spat it out into the spittoon." Fa-Hian⁴ noticed a "stone spitting vessel in this country (Kie-sha) belonging to Buddha."

BEDPANS AND URINALS.

The bedpan and urinal were also used by the patients in ancient times. Caraka mentions them to be necessary in a sick room.⁵

PUS BASINS.

Metallic basins marked with different measures were used for holding discharges after operations. In the Aśvavaidyaka⁶

¹ I'Tsing. ch. xvi.

² चोपन्यस्तभङ्गार प्रतियद्वाणि ।

* * * *

प्रतियद्वांश्चोपचारयेत् ॥

Caraka Samhitā, I. xv.

³ Sacred Books of the East. VIII. i. 11.

⁴ Beal's Records, vol. I. Introduction, xxviii.

⁵ See Page 36 and foot-note I, P. 34.

⁶ प्रदेशे लोमशे नित्यं लोमान्युतपाद्य वेधयेत् ।

प्रमाणाथैश्च पावेण रक्तं गृह्णाति वृद्धिमान् ॥

Aśvavaidyaka, XV. verse 30.

blood let out in the operation of phlebotomy, is recommended to be collected in a basin, so that the quantity may at once be determined.

PESTLE AND MORTAR.

Pestle and mortar are mentioned in the R̥gveda for preparing the Soma juice.¹ And their use in pharmacy was well-known to the ancients.

Besides the pestle and mortar of pharmacy, we find mention of a large wooden pestle used in reducing dislocation by Suśruta.² Caraka says that two pestles and motars should be kept in a lying-in-room, the object being to allow the woman some kind of work; and then she will not lie down idly on her bed if there be any delay in the delivery of the child³. Suśruta also recommends it⁴. "The mortar (ulukhala) and pestle (muśala) are to be made of very hard wood, *viz.*, both of Varana wood (Crataiga Roxburghii), or the mortar of Palāśa wood (Butea Frondosa), and the pestle of Khadira wood (Acacia Catechu). The former

¹ उलूखलमुतानामवेदिंद्र जल्युलः ॥

* * * *

● यच्चिह्नं त्वं गृहे गृहे उलूखलकं युज्यसे ।

R̥gveda, 1 M. 28 S. 1 & 2 R.

² See foot-note 6, P. 172.

³ See P. 39, and foot-note 1, P. 40.

सा चेदावीभिः संक्षिप्यमुना न प्रजायेताथैनां ब्रूयात् उत्तिष्ठमूषलमन्यतरञ्ज गृहीत्वानिनेतदु-
दूखलं धान्यपूर्णं महर्म्भुं हरधिजहिं सुहृन्मृं हरवजृम्भस् चक्रमस् चान्तरान्तरा इत्येवमुपदिश्यन्त्यके ।

Caraka Samhitā, IV. viii.

* कालातीतस्यादिनि गर्भं विशेषतः सधान्यमुदूखलंभूषलीनाभिहत्याद्विषने वा यानासने
सेवेत ।

Suśruta Samhitā, III. x.

is to be of the height of the knee and the latter three aratnis (cubits) long¹."

On the inner face of the left pillar in the eastern gate of Sanchi Tope, there is a beautiful representation of a kitchen scene, in which the ancient mortar and pestle are shown. "The mortar and two-handed pestle same as those in use at the present day in India. The mortar (okhli) is exactly the same as the Greek *κρηνη*, and the Roman *pila*; and the pestle (*musar*) is the same as the Greek *Κόραρον*, and the Roman *pilum*"²

The pestle and mortar used in pharmacy was called *aśmabhālam*. It is still used to pulverise medicaments, and is made of iron or brass.

In the *Mahāvagga*³ we find a reference to the pestle and mortar. "I allow, O Bhikkhus, the use of a *chunam* as a medicine by whomsoever has the itch, or boils, or a discharge or scabs, or whose body is ill smelling, and to those in health the use of dry dung, and of clay, and of coloring matter. I allow, the use, O Bhikkhus, of a pestle and mortar" (*udukhalā nusalāñ ka*).

SIEVES, STRAINERS AND FILTERS.

There is evidence that cloth sieve was used by the Hinc in ancient days, we find it mentioned in the *R̥gveda*⁴. The purpose of straining and filtering solid and liquid medicines respectively is mentioned to have been served by two

¹ Schol. on Katy. 1.3.3.6. footnote, *Śatapatha Brāhmaṇa* (Sacred Books of the East, 1.1.4.8.)

² Cunningham's *Bhilsa Topes*, p. 207.

³ *Mahāvagga* VI. 9. 2.

⁴ *R̥gveda*, 10m. 71s. V 2

three layers of a piece of cloth. And we know that in the prehistoric Soma rites, it "was pressed, passed through a seive, mixed with milk, and offered as the main oblation".

The reference to a cloth sieve, we find in Mohāvagga¹: "Now at that time the Bhikkhus who were sick had need of sifted chunam as medicine.

They told this thing to the Blessed One.

"I allow, O Bhikkhus, the use of a chunam sieve".

They had need of the chunam very fine.

"I allow, O Bhikkhus, the use of a cloth sieve".

Pavitra was used in the Vedic times². It was a filter. Wilson translates it: "Trough the purifying filters".

COLD AND HOT APPLICATIONS.

To relieve colic pains, vessels made of silver, copper or precious stones, containing cold water, are directed to be placed upon the part or better upon the navel³. Besides these, leather vessels containing cold water are also directed to be used for reducing the temperature in dilirium tremens.⁴

¹ Mohāvagga VI. 10. 1.

² मध्यः पुनानाः कविभिः पविदैर्युभिर्हिन्वंत्यक्तुभिर्धनुवीः ॥

Rgveda, 3m. 31 s. 16 Bk-

अथ दृष्टन्ति हस्तिनो भरिवैर्मध्यः पुनन्ति धारया पविदैः ॥

Ibid, 3m. 36 s. 7 Bk.

³ मणिराजत ताम्बानि भाजनानि च सर्व्वशः ।

वारिपूर्णानि ताम्बस्य शूलस्योपरि निक्षिपेत् ॥

Suśruta Saṁhitā, VI. xlii.

⁴ हिमराजत कांस्यानां पात्राणां शीतवारिभिः ।

पूर्णानां हिमपूर्णानां द्रवतानां पचमाहताः ॥

Caraka Saṁhitā, VI. xii.

Heat is directed to be applied to the patient's body in various ways¹ :—

I. Tāpasveda:—palm of the hand, brass dish, sand, cloth, potsherd &c. are the means mentioned for applying heat to the body.

II. Uṣṇasveda:—potsherds, stone, bricks, or iron balls are to be heated to redness and then water is to be sprinkled upon them. The part to be fomented is covered by a wet piece of thick lint and then the heated materials are to be applied over it. Or heat may be applied by means of a narrow vessel containing hot decoctions. The vessel is to be surrounded by a piece of

¹ चतुर्विधः स्वेदस्तद् यथा । तापस्वेद उष्णस्वेद उपनाहस्वेदोद्वेग स्वेद इति ।
अत्र सर्वस्वेद विकल्पावरोधः ॥

तत्र ताप-स्वेदः । पाणि कांस्यकन्दकपाल वालुकावस्त्रैः प्रयुज्यते शयानस्थचाङ्गतापो बहुशः
खादिराङ्गारैरिति । उष्ण-स्वेदस्तु कपाल पाषाणैश्चकालोह-पिण्डान्नघ्नवर्णानङ्गि रासिच्छेदस्त
द्रव्यैर्वातै राद्रालक्तक परिवेष्टितसङ्ग-प्रदेशं स्वेदयेत् । मांस रस पयोदधि धान्यास्त्रवातहर
पक्वमङ्ग काय पूर्णं वा कूर्ममनुतप्तं प्राढव्योष्णं गृह्णीयात् । पार्श्वं छिद्रेण वा कुम्भेनाधी-
मुखेन तस्य मुखमभिसन्धाय तस्मिन् छिद्रे हस्ति गुच्छाकारां नाडीं प्रविधाय तम् स्वेदयेत् ।

मुखोपविष्टं स्त्रभङ्गं गुरु प्रावरणाढतं ।

हस्तिगुम्फिकया नाद्या स्वेदयेद्वात-रोगिणं ॥

मुखं सर्वाङ्गं हि वा नच क्षिप्यति मानवं ।

व्यामार्शमात्रा निर्वक्रा हस्ति हस्त समाकृतिः ॥

स्वेदनाथं हिता नाडी कैलिङ्गी हस्ती गुम्फिका ।

* * * * *

उपनाह स्वेदस्तु वातहरमूलकान्धोरस्त पिष्टैर्लवण प्रगाढैः सुस्निग्धैः सुखोष्णैः प्रदिह्य
स्वेदयेत् । एवं काकोल्यादिभिः सुरसादिभित्तिलावसी सर्प कल्मैः कृगरा पायसोत्कारिका-
भिर्व्वेसवारैः शाल्यैर्ब्वातनुवस्त्रावनहैः स्वेदयेत् ।

द्रव स्वेदस्तु-वातहर द्रव्यकाय पूर्णं कोण कटाहं द्रोण्यां वावगाह्य स्वेदयेत् । एवं पयोमांस-
रस-घृष-तैल-धान्यास्त्र-घृत-वसा सूक्ष्मवगाह्य सुखोष्णैः कषायैः परिषिद्धेति ।

cloth to prevent the skin from being burnt. Or heat may be applied by the following device:—an earthen vessel or *kalasī* containing hot decoctions is to be closed; and the vessel is then to be inverted. Then a hole should be bored on its side, and a tube shaped like an elephant's proboscis is fitted to it; the vapour issuing from the tube is allowed to play on the part.

To apply vapour bath:—put the hot infusion of medicinal substances into an earthen vessel and close its mouth. Drill a hole into the side of the vessel and adapt a tube to it. The tube may be either metallic or wooden. The tube should be two hands (forearm and hand) long and made of three pieces; the end of the tube which should taper like a cow's tail must be six *añguli* long. The patient should be seated on a stool and well covered with cloth. The tube is then introduced inside the blanket, and thus the issuing vapours heat the whole body. (*Sārṅgadhara*¹).

Suśruta says that the tube should be half *byām* (*i.e.*, the distance between the two hands when extended) long, bent thrice and shaped like an elephant's proboscis. Sometimes a large stone slab is to be heated with burning wood of *Acacia Catechu*. Then after removing the ashes, the patient is directed to lie upon it. A tent or cloth-cover having four doors is sometimes required for the patient to sit in, and heat is applied by burning wood outside it.

¹ अथवा वातनिनाशिद्रव्यकायरसादिभिः ।

उष्णैर्घटं पूरयित्वा पार्श्वे क्षिद्रं विधाय च ॥

विमुद्रास्थं विखण्डाच्च धातुजां काष्ठजां तथा ।

षडङ्गुलास्यां गोपुच्छां नाडीं युक्तात् द्विहस्तिकां ॥

मुखोपविष्टं स्वभ्यक्तं गुरुप्रावरणावृतम् ॥

हस्तीशृङ्गिकाया नाद्या स्वेदयेद्वातरोगिणम् ॥

Sārṅgadhara Saṁgraha, III, ii,

III. Upānahasveda or poultices :—roots of medicinal plants are to be pressed and formed into a paste with mustard, sesame etc. This is to be heated, put on a thin cloth and so applied.

IV. Dravasveda or hot bath :—the patient is to sit in a tub or vessel of hot water. Iron pails or tubs are recommended to be used by patients to take bath in some infusions. Śārṅgadharma says¹: The tub (droṇī) should be made of gold, or silver, or copper, or iron, or wood. The height and length of the tub should measure thirty-six aṅguli each. When the patient sits inside, the height of water should stand six aṅguli above the navel. A droṇī filled with oil is to be used for placing an unconscious patient in it to overcome the shock caused by fall, blows, fractures and other injuries.

Cakradatta² describes the four methods of applying heat, Bhāvamiśra also describes them similarly³. Hārīta, however, mentions seven methods of heat-application⁴.

- ¹ सोवर्णं राजतं वापि ताम्रमायसञ्च दाहजम् ।
कोष्ठकं तच्च कुर्वीतोच्छायि षट्चिंशदङ्गुलम् ॥
आयस्मिन् तदेवस्याश्चतुष्कं मष्टणं तथा ।
नाभिः षडङ्गुलं यावन्मग्नः काथस्य धारया ॥

Śārṅgadharma Samgraha, III. ii.

- ² तत्रैः सैकतपाणिकांश्चवसनैः स्वेदोऽथवाङ्गरक-
लेपाद्वातहरैः सहास्रलवणक्षेहैः सुखोष्णैर्भवेत् ।
एवं तप्तपयोऽम्बूवातश्मनकाथादिसैकादिभि-
स्तपेस्तोयनिषेचनोद्भवहृद्वायैः शिलाद्यैः क्रमात् ॥

Cakradatta, Svedādbikāra.

- ³ स्वेदश्चतुर्विधः प्रोक्तस्तपोभस्वेदसंज्ञितः ।
उपनाहो द्रवः स्वेदः स्निग्धं वातातिहारिणः ।
तापस्वेद उष्णस्वेदश्च ताभ्यां संज्ञितः ।

Bhava Prokāśa, I. i.

- ⁴ स्वेदः सप्तविधः प्रोक्तो लोष्टस्वेदो वायस्वेदोऽग्निज्वालास्वेदः ।
षट्स्वेदो जलस्वेदो फलस्वेदो बालुकास्वेदश्च ।

Hārītā-Saṁhita, V. iv.

BALANCE OR MĀNADAṆḌA.

For weighing medicinal substances, the scales and balance are often mentioned. They mention a set of weights and measures to be used in weighing substances. Alberuni¹ describes the Hindu balance thus:—"The balance with which the Hindus weigh things, are *χαρίσ τίοντες* of which the weights are immovable, whilst the scales move on certain marks and lines. Therefore the balance is called *tūla*. The first lines mark the unit of the weight from 1 to 5, and further on to 10; the following lines mean the tenths, 10, 20, 30, &c. In Fergusson's Tree and Serpent Worship we have a diagram of steel-yard, where a man is represented as stepping in the scale, apparently to weigh himself². The ordinary balance is still in common use amongst the *kavirājes* of the present day.

COLLYRIUM POTS.

The Hindus used to apply collyrium to their eyes, from a very early time. It is said to stimulate the growth of eye-lashes, brighten the lustre of the eye-balls and clean the pupil³.

Bhāvamiśra⁴ recommends us to use collyrium as it improves the visual power and cures many diseases of the eye. It is

¹ Alberuni's India. Trans, by Sachau, vol. 1, p. 146.

² The Tree and Serpent Worship, the pl. lxxxiii. fig. 1.

³ पञ्चलं विशदं कान्तममलोष्णं मण्डलं ॥
नेत्रमञ्जनं संयोगादभवेच्चासल तारकं ।

Suśrutā Saṁhitā, IV. xxiv.

⁴ सौवीरमञ्जनं नित्यं हितमक्षोप्तो भजेत् ।
लोचने भवतस्तेन मनोऽपि सुखदर्शनं ॥
“सौवीर” श्वेत सुरमा इति लोके प्रसिद्धम् ।
क्षोत्तोऽञ्जनं सतं श्रेष्ठं विषुद्धं सिन्धुसम्भवम् ॥

contra-indicated in patients suffering from fever, emesis, exhaustion, &c.

Suśruta mentions collyrium pots of different metals intended for different kinds of collyrium then in use—

gold	pots	for	sweet	collyrium.
silver	pots	for	acid	collyrium.
horn	pots	for	salt	collyrium.
copper & iron	pots	for	astrigent	collyrium.
lapis lazuli	pots	for	sour or acid	collyrium.
bell-metal	pots	for	bitter	collyrium.

He also mentions pots of ivory, or crystal, or coral, or horn, or conch-shell, or stone, or gold, or silver¹.

He also mentions a piece of bamboo for storing collyrium². A bamboo is still used by the poor for keeping oil in India. For a similar purpose the wood of Khadira (*Accacia Catechu*) is also

दृष्टेः कण्डूलहरं दाहकं दृष्टापहम् ।

अक्षोरुपावहचैव सहनेसारतातपौ ॥

नेत्ररोगा न जायन्ते तस्मादञ्जनमाचरेत् ।

“श्रोताञ्जनं” कणसुरमा इति लोके प्रसिद्धं ॥ “विशुद्धं” शोधनं विनापि ।

“सिन्धुसम्भवम्” सिन्धुनाम पर्वतस्य सम्भवम् ।

रादौ जागरितः शान्तः कर्हिती भुक्तवांस्तथा ।

ज्वरातुरः शिरस्त्राती नाक्षीरञ्जनमाचरेत् ।

Bhūva Prokūṣa, I. i.

¹ See foot-note 3, P. 67.

² कुलकाशो कशलाश्चपि यश्च नखिनोत्पलैः ॥

पुष्पैर्हरेण कण्ठाद्वापथ्यामलकं संयुतेः ।

सर्पिर्नधुयुतैश्चूर्णवणुनाड्यामवस्थितैः ॥

Suśruta Saṁhitā, VI. xvii.

recommended¹. For storing oil, Dr̥ghavala² mentions the use of vessels of stone or the horn of a lamb or iron.

MEDICINE GLASS.

Sukti or shell of mussel was used as medicine glass. The shell of the fresh water mussels unionacea is mentioned to be used for holding a dose of medicine for administering it to a patient³. They generally have equivalve, though not equisided, shells which are covered externally with a smooth brown epidermis and internally by a mother-of-pearl layer. Such a shell "is said to have been formerly much used in England by painters for holding their colour and so the commonest variety is termed unio pictorua. To apply oleaginous errhines, Suśruta⁴ recommends us to use metallic pots or the shell of mussel. It is still used in India for feeding the babies with milk and also for administering medicines to the patient. Heyne⁵ (1814) says that "according to the nature of the disender, the medicines should be taken out of gold, silver or brass vessels. But if these should not be at hand you may use iron or even earthen vessel."

¹ सैन्धवोपहितं युञ्जानिहितं वेणुगह्वरे ।

निदीयकदृष्टतन्नाजं पिबन्त्यः सैन्धवं मधु ॥

रसमामलकञ्चापि पक्वं सम्यङ् निधापयेत् ।

कोशे खदिरनिर्भाणे तद्वत् क्षुद्राञ्जनं हितं ॥

Suśruta Samhitā, VI. xvii.

² See foot note 4, P. 67.

³ तत उपसंस्कृतशरीरः प्रातः प्रातरुत्थाय पाणिशुद्धिमाच' चैद्विधं प्रतिसंख्योपयुञ्जीत ।

Suśruta Samhitā, IV. x.

⁴ वामहस्तं प्रदेशिन्धु योनामितनालायाय विद्युद्भ्रंशोत्तसि दक्षिणहस्तेन केहसुष्ठानु तप्तं रजतं सुवर्णं ताम्रसुत्पाव शुक्लनामन्यतमं यं शुक्ला पिचुना वा सुखोष्णं केहमद्रुतमासिधेद्व्यवच्छिन्नधारं यथानिवेन प्राप्नोति ।

Ibid. IV. xl.

⁵ Dr. Heyne's Indian Tracts,

DROPPER.

The Hindus used a tent of cotton as a drop conductor. Cakradatta¹ advises us to drop medicines into the eyes thus:—the patient should be made to lie down in a place free from draught; the surgeon is to open his eye with the left hand, while with the right, he allows 10 or 12 drops of medicine to fall from a height of two aṅguli on the eye from a tent of cotton, immersed in medicine contained in a clean vessel.

GRIND-STONE.

Grind-stone to pulverise medicaments is mentioned. In the Mahāvagga² we find a reference to it. "I allow, O Bhikkhus, the use of a grind stone, and of another stone to grind upon" (pisana-silā ka pisana poto ka—Buddhaghosha).

STONE AND IRON MULLER.

For similar purpose a stone slab and iron muller are necessary to make pastes and powders of medicines. On the inner face of the left pillar in the eastern gate of Sanchi Topes, the kitchen scene is represented, in which "a fourth woman is seated grinding spices or condiments on the sil, or flat stone, with a hant or round muller³".

KHAL OR ELLIPTICAL MORTAR OF STONE AND PESTLE.

To prepare medicines to be exhibited to the patients, a small

¹ निवातस्थस्य वामेन पाणिनीन्दील्य लोचनम् ।

शुक्तीप्रलम्बयान्नेन पितुवर्च्या कनीनिके ।

दश द्वादश वा विन्दून् द्वाङ्गुलादवसेचयेत् ।

Cakradatta, Āśotancyāñfana Adhikāra.

² Mahāvagga vi. 3.2.

³ Cunningham Cunningham's Bhilsa Topes, p. 206.

elliptical mortar is generally used when the medicines require to be thoroughly mixed with some excipient.

The following appliances, besides those mentioned before, become necessary in pharmacy :—

1. Iron pails of various sizes.
2. Vessels of iron, copper, silver, brass and earth for storing medicines.
3. Spoons of wood or darvi; large metallic spoon or hata.
4. Iron sandamśa or pinchers.
5. Rods of wood or iron.
6. Blacksmith's bellows.
7. Ankuśa or hooks like the elephant driver's goad.
8. Iron hammer.
9. Earthen crucibles of different sizes.

CHAPTER IX.

THE CONCLUSION.

In the recent edition of the *System of Medicine*, Prof. Albutt¹ begins his article on the History of medicine with the following observations: "The medicine of Egypt and the East, extensive and intricate as it was, in so far as it was not Greek did not contain even the rudiments of science. To it Western medicine owes virtually nothing, and in this article at any rate, it may be disregarded". Prof. Osler² also speaks in the same strain: "Crude and bizzare among the primitive nations, these ideas of disease received among the Greeks and Romans a practical development worthy of these peoples. There have been systemes of so-called divine healing in all the great civilizations, but for beauty of conception and for grandeur of detail in the execution, all are as nothing in comparison with the cult of the son of Appolo, and of Æsculapius, the god of healing." "Scientific medicine, the product of a union of religion with philosophy, had its origin in a remarkable conjunction of gifts and conditions among the Greeks in the sixth centuries".

Such opinions remind us of an asserption of Sir William Jones³ "that there is no evidence that in any language of Asia there exists one original treatise on medicine considered as science". About a century has elapsed since the time of Sir William but we see that the same misconception still prevails in the minds of

¹ Albutt and Rolleston. *System of Medicine*, vol. I, p. 1.

² Osler and Mærae's *System of Medicine*.

³ Discourse xi, Sir William Jones's Works, Vol. I, p. 161.

the scholars. Macdonell¹ gives us a succinct account of the intellectual debt of Europe to the various branches of science and art of the Hindus but regrets that the genetic connection of Indian medicine with that of Greece can not at present be definitely settled. "The question as to whether Indian medical science in its earlier period was affected by that of the Greeks can not be answered with certainty, the two systems not having hitherto been compared with sufficient care." The European mind is quite naturally in the habit of tracing all knowledge to Greece, the fountain of all their knowledge in philosophy and science. But impartial writers are not wanting to vindicate the claims of the Hindus. So Wise remarks as follows² :—"Facts regarding the ancient history of medicine have been sought for only in the classical authors of Greece and Rome and have been arranged to suit a traditional theory which repudiated all systems which did not proceed from a Grecian source. We are familiar from our youth with classical history and love to recall events illustrated by the torch of genius and depicted on our memories ; and it requires a thorough examination of a subject, a careful weighing of new evidence, and a degree of ingenuousness not always to be found to alter early impressions. Still candour and truth require us to examine the value of new facts in history as they are discovered, so as to arrive at just conclusions". Royle maintains³ that "from the mixture, however, of much ignorance and absurdity with what is valuable, many will be apt to despise altogether the medicine of the East. But if it be recollected how long in Europe prevailed the influence of Galen,

¹ History of Sanskrit Literature, ch. xvi.

² Review of the History of Medicine. Introduction.

³ Antiquity of Hindn Medicine, p. 81.

as well as how many absurd formulas still figure in some continental pharmacopœas, as also how comparatively recent is the time since our own was so greatly improved; some feeling of humiliation will control the pride with which we now view the medical sciences". Neuburger says¹; "The medicine of the Indians, if it does not equal the best achievements of their race, at least nearly approaches them. and owing to its wealth of knowledge, depth of speculation and systematic construction, takes an outstanding position in the history of oriental medicine." It is no doubt unsatisfactory to find that such notions are still allowed to stand in the way of impartial conclusions by eminent men of science especially by those who write history of medicine. But it is not the fault of the historians alone, the fault lies with us for not having supplied them with adequate materials. Something has been done in this field of research by men like Wilson, Heyne, Ainslie, Royle, Dutt, Thacore Shaheb, Jolley, Hoernle and others, but it is nothing when compared to what is required to be done. To supply this want partially, we have endeavoured in this monograph to describe the surgical instruments of the Hindus, with a comparative study of the instruments of the Greek, Roman and Arab surgeons, and of the surgeons in modern times. By a careful study of this subject, we can not avoid the conclusion that the medicine of India though it was not Greek, contained the requirements of science and has a fair claim to be considered in the history of medicine. To it western medicine really owes something and so the subject has been studied and investigated thoroughly.

¹ Neuburger. *History of Medicine*. Trans. by Playfair. Vol. I. p. 437.

Apart from the usefulness of the study for collecting materials for the history of medicine, there are good reasons for a critical examination of the subject. The knowledge of the Hindus in medical science was by no means rudimentary. There is evidence to show that they were inferior to none in the quality or quantity of the knowledge of the science at that early age. Hoernle says:¹ "Its extent and accuracy are surprising when we allow for their early age—probably the sixth century before Christ—and their peculiar methods of definition." They practised dissection of human bodies and their anatomical studies have the mark of high order. "We have seen that they used various forms of surgical instruments. The Hindus cut for stone cowered for the cataract and extracted the foetus from the womb". They performed abdominal section, practised cranial surgery successfully and no region of the body was thought sacred to the knife. They repaired nose and ears by plastic operations, treated fractures and reduced dislocations, and were experts in performing amputations. They reduced hernia, cured piles and fistula-in-ano by surgical technique, and inoculated and vaccinated for small-pox. Field surgery was thoroughly understood and arrows were extracted with skill. They were acquainted with the circulation of the blood,²

¹ Hoernle's Osteology, Preface, P. iii.

² यामिरिदं शरीरमाराम इव जलहारिणीभिः केदार इव च कृत्वाभिरुपसिञ्चते-
ऽगुप्यते चाकुचन प्रसारयादिभिर्विशेषैः । दुमपत्रसिवनीनामिव च तासां प्रतानास्तासां
नामिर्मुलं ततश्च प्रसरन्त्युद्गमघसित्व्यं च ।

Suśruta Saṁhitā, III, vii.

दिङ्मूलोत्पत्तिरसृजो दिङ्मूलेनैव धार्यते ।

रक्तं जीवस्य चाधारस्तस्माद्रक्तेदसृग्बुधः ॥

Bhāva-Prakāśa, I. ii.

the distinction between the artery and vein,¹ the use of anæsthetics, the means of arresting hæmorrhage and the proper treatment of surgical wounds. They enumerated 107 vital parts of the body to be avoided, if possible, by the surgeon in practising his handicraft.²

In medicine they first propounded the humoural pathology. Though it seems fanciful in the light of modern culture, it must be admitted that no other theory has been attempted to explain the causation of disease in recent times. "They were the first nation who employed minerals internally and to them we owe the therapeutic use of mercury and arsenic in intermittents". They introduced massage, postural treatment and magnet in therapeutics. They excelled in chemistry and contrived many instruments for the preparation of chemical compounds. Atomic theory was discovered by Kaṇāda; and "they knew how to prepare sulphuric acid, nitric acid and muriatic acid, the oxide of copper, iron, lead (of which they had both the red oxide and litharge),

विश्वता द्रवता रागश्चलनं विलयस्तथा ।

भूयादिपञ्चभूतानामिते रक्ते गुणाः स्मृताः ॥

रक्ते दुष्टे भवेच्छीथो रक्तमण्डलनिव च ।

व्यथाः दाहश्च पाकश्च कण्डूश्च पीडकोद्गमः ।

हृद्वे रक्ताङ्गं नेत्रं च शिराणां पूर्णता तथा ।

गात्राणां गौरवं निद्रा मेहो दाहश्च जायते ॥

Sārāgadharā-Saṁgraha, III. xii.

Bhāva Prakāśa, I. ii.

¹ इन्द्रगोपप्रभं श्रेयं प्रकृतिस्थसमंहतम् ।

Sārāgadharā Saṁgraha, III. xii.

गृद्धाः समस्थिताः खिग्धा रोहिन्वाः शुद्धगोणितम् ।

Aṣṭāṅga Hr̥daya Saṁhitā, II. iii.

² सद्योत्तरं मर्त्यशतं ।

Sūśruta Saṁhitā, III. vi.

tin, and zinc; the sulphuret¹ of iron, copper, mercury, antimony and arsenic; the sulphate of copper, zinc and iron; and carbonates of lead and iron¹". The processes of solution, calcination and distillation were discovered by them.

They understood the action of drugs and no less than 500 classes of medicinal agents are enumerated and arranged according to their virtues in curing diseases, and their remedial agents have been collected from the vegetable, animal and mineral kingdoms. There are 41 different forms in which the medicaments may be exhibited to the patient. We have the earliest notice respecting zoology and botanical geography in their works. They had a complete nomenclature of diseases which are described minutely as regards their ætiology, symptomatology, diagnosis, pathology, prognosis and treatment.

Veterinary science was well known to them, and treatises on horses and elephants—*Aśvavaidyaka* and *Pālakāpya*² are still extant, and will repay perusal. Even there is a treatise on the treatment of plants and trees³. Thus we see that the Hindu medical science must not be condemned offhand and requires a careful and sympathetic research by scholars, before it can be excluded from the history of the science.

But I must be careful not to allow my enthusiast admiration carry me too far. It is quite true that the *Āyurvedic* system has its faults. It has been remarked that "it consisted of erroneous

¹ Elphinstone's History of India, 8th ed. p. 160.

² Another book on the medicine of elephants is quoted by Alberuni. See Sachau's Preface to *Indica*, p. xl.

³ For the bibliography of the *Āyurvedic* books, see my work "*Materials, Biographical and Bibliographical, for the History of Hindu Medicine*". (In the press).

doctrines founded upon a most fanciful anatomy, physiology and pathology. Much indeed could hardly be expected of a science based upon an anatomy which taught that the navel "constituted a centre from which a vascular system, including 40 principal vessels originated¹; upon a physiology which declared that these vessels were destined to convey blood, air, bile and phlegm to all parts of the body, and upon a pathology which maintained that disease depended either upon derangements of one or more of these humours or "upon the influence of good or evil spirits".² It must however be remembered that this criticism refers to a theory elaborated some 3000 years before. The idea that the navel formed the centre of the vascular system apparently had its origin in the foetal circulation³. The position of the heart was well-known and its function as a profeelling organ is

¹ यावत्सु सिराः काये सम्भवन्ति शरीरिणां ।
नाभ्यां सर्वा निवहन्ताः प्रतन्वन्ति समन्ततः ॥
नाभिस्थाः प्राणिनां प्राणाः प्राणान्नाभिर्वुपश्रिता ।
सिराभिराहता नाभिश्चक्रामिर्विवारकैः ॥

तासां मूलसिरासुत्वारिश्चतासां वातवाहिन्यो दश पित्तवाहिन्यो दश कफवाहिन्यो दश दश रक्तवाहिन्यः ।

Suśruta Saṁhitā, III. vii.

तस्यान्तरेण नाभेऽसु ज्योतिःस्थानं भुवं स्मृतं ।
तदा धमति वातसु देहसेनास्य वर्धते ॥

Ibid. III. iv.

² A course of lectures on the Principles and Practice of Medicine delivered at Calcutta Medical College. By Francis. 1868.

³ मातुस्तु खलु रसवह्नायां तासां गर्भनाभिनाडी प्रतिवह्ना सास्य मातुराहाररस-
वीर्यमभिषङ्गति । तेनोपसेहेनास्याभिर्बहिर्भवति ।

Suśruta Saṁhitā, III. iii.

described in the ancient books¹. In the later Tantras the origin of the nerves from the spinal cord and the brain is distinctly stated². The ancient Hindus, like the Babylonians, thought the heart to be the seat of the understanding, and the liver as the central organ of the blood. The Greeks were the most cultured nation at that age, and the knowledge of the two nations can be compared to our advantage. The Hindus did not share with the Greeks the belief that the uterus is "an animal within an animal" and that it can be attracted by pleasant smells and repelled by pungent substances"³. The humoural pathology was also the keystone of the Grecian system. The belief in the good and evil spirit was the only alternative to the pathologists when the microscope and the germ theory of diseases were unknown. It is highly creditable to the classical Greek physicians for banishing superstition from the practice of the art; but we know that the later Greek writers Aetius, Alexander and Paulus, and the Latin medical literature, were not free from its baneful influence. The belief in charms and miracles in the cure of diseases seems to be universal and is

¹ स रसः इत्युच्यते । तस्य च हृदयं स्थानं स हृदयाश्चतुर्भिर्गतीः धमनीरनुप्रविश्योद्गता दश दश चाघोगामित्यस्यतत्त्वसिद्धय्याः कृत्स्नं शरीरमहरहृत्संप्रयति वर्धयति धारयति व्यापयति जीवयति चाष्टष्टहेतुकेन कर्मणा ।

Suśruta Samhitā, I. xiv.

• हे हे तिर्यक्गते नास्यौ चतुर्भिर्गतिः संख्या ।

• मेरुदण्डेस्थिताः सर्वे सृजे मणिरणाविव ॥

* * * *

ऊर्ध्वमूलमधःशाखं वृक्षाकारं कलेवरं ।

यथावत्पदले तद्वत् शरीरे नाड्यस्थिताः ॥

Tantra.

² Paulus Aegineta, Adam's Commentary, Vol. I. P. 636.

working even at the present time. Adams says¹ that "considering the faith which many educated persons now repose in the virtues of galvanic rings and garters, the present generation has little ground for laughing at the credulity of our forefathers, with respect to amulets and other phylacteries".

In later times, attempts have been made to substitute other theories in the place of the humoral, and we know with what results. "Paracelsus substituted an equally baseless hypothesis, that the fundamental element of the human body were three principles: sal, the solid element; quicksilver, the liquid; and sulphur, the aerial. This formula was the badge of the Paracelsist school up to the end of the 17th century." Sylvius and Willi (17th century) of the Iatro-chemical school "referred most diseases to morbid matters or "acrimonies" produced by perverted secretions, and these being sometimes too alkaline, sometimes too acid, the antithesis of acid and alkali became the badge or catch word" of their system. Friedrich Hoffman (1660-1742) constructed another system which "supposed life to be a universally diffused ether, which entering the animal body, became transformed in the brain into Pneuma or nervous fluid. "George Ernest Stahl (1660-1734) believed" in the hypothesis of Animism, and "the symptoms of disease were regarded as the conscious efforts of the soul to overcome the morbid influences". William Cullen (1712-90) "propounded a new system of medicine, intended to reconcile the opposing views of his predecessors. Its main feature was the importance attached to the nervous system in the causation of disease." Lastly the "Brunonian" system of John Brown, based on

¹ Adam's Commentary on Paul.

the doctrine of stimulus, and Hahneman's theory of homœopathy need be mentioned here to complete the list.¹ Thus we see that even some of the eminent men of science indulged in fanciful theories in quite modern times.

The study of ancient Hindu medicine has an antiquarian value. It is perhaps the oldest system of medical science still extant. Fragments of Egyptian and Assyrian medicine have no doubt been unearthed. But these cannot be compared with the complete system of the medical science as preserved in the early Sanskrit works on the subject. The Hindus believe their science of medicine to be of divine origin and this belief is founded upon the fact that the existence of the medical profession can be traced back to prehistoric times. The humoural theory is mentioned in the R̥gveda² which according to the consensus of opinions amongst the European savants can not be later than 2000 B.C., and possibly earlier. The Buddhists relate a story, how, in one of his former births, Buddha was born as a medicine-man. "In the Mahosadha birth the archangel Sakka came to him as he was being born, and placing some fine sandal-wood in his hand, went away. He came out from the womb holding this in his fist. His mother asked him "What is it you hold, dear, as you come?" He answered "Medicine, mother!" So because he came holding medicine, they gave him the name of medicine-child (oṣadhadhāraka). Taking the medicine they kept it in a chatty (an earthenware water-pot) and it became

¹ Medicine in modern Europe. Payne in Albutt's System of Medicine, vol. I, p. 28, 29, 34.

² औषानं शंयोर्मकाय सन्नि विधातु शनं वदतं शुभस्यती ॥

R̥gveda, i. 34, 6.

a drug by which all the sickness of the blind and deaf and others as many as came, was healed—so the saying sprang up, "This is a powerful drug"; and hence he was called Mahosadha (The great medicine-man).¹ This early date of the science amongst the Hindus is not exceptional. It is now well-known that so severe an operation as trephining the skull was often performed in the early stone age. "Trephined skulls from neolithic period have been found in most European countries, in Algiers, the Canaries, North America, Mexico, Peru and the Argentine"². In the Code of Hammurabi, king of Babylon (2285-2242 B. C.), there are thirteen articles regulating medical practice. One deals with the responsibilities of a surgeon performing operations on the eye. The laws Hammurabi lay down that:—

"If a Physician cause a severe operation wound with a bronze operating knife and cure the patient, or if he open a tumour (cavity) with a bronze operating knife and save his eye, he shall have ten shekels of silver.

"If it be a freedman, he shall have five shekels.

"If it be any one's slave, his owner shall give the physician two shekels of silver.

"If the physician make a severe wound with a bronze operating knife and the patient die, or if he open a growth with a bronze operating knife and the patient lose his eye, he shall have his hands cut off.

"If a physician make a severe wound on the person of

¹ Rhys David's Buddhist Birth Stories, vol. I, p. 67-68.

² Neuburger's History of Medicine, P. 3.

a slave belonging to a freed man with the bronze operating knife and kill him, he shall replace the slave by another slave.

"If a physician heal a broken bone or cure diseased bowels, the patient shall pay the physician five shekels of silver."¹

Homer pays tribute to Egypt for her

"Patron-god imparts

To all the Pharian race his healing arts."

Herodotus says that the Egyptian physicians were specialists of particular diseases, and Clement of Alexandria mentions forty-two Hermetic books on medicine by the god Thot.

"According to Manetho, he (Teta) constructed the Royal castle of Memphis and wrote a work on anatomy² being particularly occupied with medicine. The latter supposition is rendered more complete to a certain extent by the account, due to Ebers Papyrus³, that the method of making the hair grow, described accurately therein, was supposed to have been discovered by our king's mother, Shesh."⁴ Teta was the second king of the first dynasty of the old Memphis kingdom and flourished in 4366 B. C. King Senta of the second dynasty owned a medical work which belonged to Semti or Hesepti (4266 B. C.), the 5th king of the first dynasty.⁵ "Tosorthros of the third dynasty, was said to have composed a treatise on medicine,⁶ a fact which

¹ Neuberger. *History of Medicine*, P. 18.

² Manetho, in Müller-Didot, *Fragmenta Historicum Græc*, vol. II, pp. 539, 540.

³ Ebers Papyrus, Pl. lxvi, 1, 5.

⁴ *Historian's History of the World*, vol. I, Egypt and Mesopotamia. p. 91.

⁵ *Ibid*, p. 68.

⁶ Manetho, etc., vol. II, p. 544.

caused him to be identified with the healing god Imhotpâ."¹ These facts suggest a great age for Egyptian medicine, Medicine flourished among the Assyrians: "Fragments of an old work on medicine have been found, which show that all known diseases have been classified and their symptoms described; and the medical mixtures considered appropriate to each being compounded and prescribed quite in modern fashion."²

The oldest medical treatise extant amongst the Chinese is the Neiching, the authorship being attributed to Hwang-ti; it dates back to B. C. 2597. Mr. Gatzlaff,³ missionary in China, has given us a short view of a celebrated work, in 40 volumes, on Chinese medicines, which is called Ching che chun ching *i. e.*, "Approved marking line of medical practice."⁴ So the Hippocratic treatises (460 B. C.) are rather modern compilations compared to these ancient books; and as told by Plato, the priest of Sais was fully justified when he addressed to Solon: "You Greeks, you are but children."⁵

It will be seen again that a comparative study of the science discloses remarkable affinity to the systems of the other contemporary nations. The fabulous origin of medicine in India and Greece can not fail to attract the notice of even a casual observer. The resemblance of Dakṣa, the preceptor of the two Aśvins, the offspring of Sun, who after learning the

¹ Ibid, p. 544 and 545.

Quoted in Maspero's "The Dawn of Civilization." Edited by Prof. Sayce, 5th ed. p. 238.

² Assyria; its Princes, Priests and Peoples, Sayce, p. 119.

³ Proceedings of the Asiatic Society, Part VII, p. 154.

⁴ Boyle. Antiquity of Hindu Medicine, p. 67.

⁵ Timæus, p. 22.

Āyurveda from their father became the medical attendants of the gods, to Æsculapius—the reputed son of Apollo, and his two sons Machaon and Podalarius, celebrated in the Homeric poems, is indeed remarkable. More remarkable is the belief in humoural pathology shared by the two nations, separated from each other by continents and seas, and alienated from each other by the differences in customs, manners and religion. The theory of independent origin and developement falls to the ground, especially when we consider the strange coincidence in the surgical instruments used by the two nations in performing surgical operations. Some of the instruments used by the Hindus were not only identical in structure and shape to the instruments of the Greeks, but they had even the same name. Thus for instance, the alābu yantra of the Hindus corresponds to the description of the cucurbitula of the Greeks, and both the terms mean a gourd. A śṛṅga is the horn; aṅguli yantra or mudrikā is the finger or ring-knife; yoni-vraṇekṣaṇa is the diopter or vaginal speculum; aṅkuśa is the hook; &c. Some instruments though they have different names are identical in structure and uses. Thus, the Scammum Hippocraticum or the Plinthium Nelei is the Greek counterpart of the Hindu kapāśayana; the lithotomy binding of the yantraśatakam; the glyster of the vastiyantra; the saw of the karapatra; the needle of the sūci; &c. Again many surgical operations are similarly described in both the systems, as for examples, the operations for stone and cataract may be cited. In the description of diseases, passages occur in books which seem to be a literal translation of one from the other. Thus in describing the symptoms of hydrophobia, Paulus quotes Rufus who pronounces it to be a

species of melancholy and then observes "Which reason accords also with those who say that they think they saw the image of the dog that bit them in water". The word "those" in the above sentence becomes clear to us when we read a similar passage in the kalpasthāna of the Suśruta Sāmhita, and it may be thus translated:¹ "If the patient sees the image of the animal that bit him in the water or mirror, he is sure to die." Other passages might be multiplied but our limited space forbids any further quotations. All these coincidences can scarcely be accidental; and though we may not be able to trace the actual progress of medicine from India to Greece, yet the evidence in favour of its transmission is too strong to be held in doubt.

Thus the question of the relation of the medical science of the Hindus to that of the Greeks naturally suggests itself for solution. The possibility of a dependence of the either on the other can not be dismissed offhand for we have historical evidence of communication between the two nations at a very early age. We need not dwell at length upon those shoals and quagmires of historical controversies, the alleged conquest of India by Egyptian Seostris as recorded by Diodorus Seculus² in prehistoric times; the connection of the Phœnician traders as proved by the articles of merchandise,—cinnamon, aloes, onyx, agate, ebony, tin and ivory³ diamond, gold and

¹ अमुवा यदिवाद्देशे रिष्टं तस्य विनिर्दिशेत् ॥
 वसत्यकस्माद् योऽभीष्टा शलाहृष्टापि वा जलं ।
 जलवासन्नुविद्यात् रिष्टं तमापिकौर्त्तितं ॥

Suśrutā Sāmhita, V. vi.

² I. ib. I. ch. 43. Nolan.

³ Strabo. xv 37. Quotes Megasthenes; Theophrastus quoted by MacCrindle in Ancient India as described by classical authors, p. 46; Virgil. Georg. 11. 116-17 ("India alone produces black ebony"), Georg. 1. 57. ("India sends Ivory"), Lonsdale and Lee's trans.; Horace, odes 1. 31.

embroidered work¹ the commercial enterprises of the ships of Solomon (992 B. C.) from Ezion-Gaber² under the guidance of the mariners of Hiram (B.C. 980-917) which brought back the gold of "ophir," its almug trees and ivory, apes and peacocks; the possibility of an Indo-Hellenic intercourse to explain the remarkable coincidences between the systems of philosophy current amongst the two nations, and which culminated in the bold theory of Pococke³ that Pythagoras, who is generally considered to be the founder of the healing art amongst the Greeks⁴ was an adaptation of the Buddhugurus, and the assertion that Greece must have been an Indian colony before. Let us rather tread on firmer grounds and we know that two Greek physicians, Ktesias (about 400 B.C.) and Megasthenes (300 B. C.) visited Northern India. Ktesias in his *Indica* mentions the cochineal plant, its worm and dyes, monkeys, elephant and parrot. He says that the Indians were free from headache, toothache or ophthalmia and from mouth sores or ulcers. Alexander the Great (B.C.327), so says Nearchus, employed some Hindu vaidas in his camp in India to consult them in cases of snake-bites and other dangerous ailments. Megasthenes mentions ebony as growing in Bengal, and tiger, monkey and elephants are also alluded to. Strabbo mentions that Daimacus was sent to the court of Candragupta's son, but unfortunately the book he wrote about India is lost to us. Mention also should be made of the intercourse of Egypt with India under the Ptolemies and we know, that Ptolemy

¹ Birdwood's *Industrial Arts of India*, pp. 263-4.

² I. King. ix. 27; xii, p. 22.

³ *India in Greece*.

⁴ See the *Origin and Growth of the Healing Art*—Beddoe. 162.

Philadelphous sent an embassy headed by one Dionysos to the court of Pātaliputra. Another source of dissemination of Hindu learning over the Western world is the emigration of the Buddhist missionaries to the kingdoms of Ptolemies and Greek kings as proved by the edicts of Aśoka. "And the Greek Simnoi (venerable) were no other than the Buddhist sramanas (these simnoi whom Clement of Alexandria has narrated to have rendered worship to a pyramid originally dedicated to the relics of a god, were the Buddhist Arhats (venerable) sramanas).¹ The intercourse of the East and West after the Christian era is well known and will not supply us with any proof as to the indebtedness of the Greeks and Hindus to each other; though "Dietz proves that the late Greek physicians were acquainted with the medical works of the Hindus, and availed themselves of their medicaments"; but he more particularly shows that the Arabians were familiar with them, and extolled the healing art as practised by the Indians, quite as much as that in use among the Greeks.²

But what is more important to us as a proof of the influence of the Indian medical science upon the Grecian system is the identification of drugs of Indian origin in the *meteria medica* of the Greeks. For instance the Sacred Bean of Pythagoras has been identified with Utpalam or Indian Nelumbium.³ Hippocrates the Great, who was contemporary and kinsman of Ktesias⁴ the court physician to the king of Persia, mentions:—*Sesamum Indicum* (Tila); *Nardostachys Jatamansi*

¹ Lalitvistaram. Mitter's ed. ch. I.

² Journal of Education, Vol. viii, p. 176.

³ Pratt's Flowering Plants, Vol. I, p. 67.

⁴ Galen; Comment, in libr. de artic. iii.

(*Jaṭāmāṁsī*); *Beswillia Thurifera* (*Kunduru*); *Zinziber Officinale* (*Śṛṅgavera*); and *Piper Nigrum* (*Marīci*). *Dioscorides* (1st century A.D.) in his *Materia Medica* describes:—*Agallochum*, *Bdellium*, *Ebony* (*Diosphynos Ebenaster*), *Ammomum zinziberis* (*Ginger*), *Calamus aromaticus* (sweet cane of Scripture), *Eletteria Cardamomum* (*Elaci*), *Lycium Indicum* or *Russot*, the product of *Berbera lycium*, *Atramentum* (*Indigo*), *Onyx* or the operculum of an Indian shell-fish, etc. In later times, we find *Aetius*, an Alexandrian writer of the 5th century describing Indian nuts, sandal wood, cocoanuts, etc. *Symon Set* mentions camphor; and *Paulus Aegineta* (7th century A.D.), a writer well known for his judicious condensation of the Greek medical literature, mentions *Aloes*, *Cantharides* (*Mylabris Cichory*), *Cloves* (*Caryophyllum Aromaticus*), *Millet* (*Panicum Halicum*), *Costos* (root of *Auklandia Costos*), *Cassia* (*Cinnamomum Cassia*), Indian stones as amulets, *Malabathri* or *tejpāt* (*Laurus Cassia*), *Ambar*, etc.

Now let us reproduce some of the conclusions arrived at by Western scholars as the result of the controversy. As regards philosophy, *Colebrooke*¹ asserts that “the Hindus were teachers and not learners”. *Cunningham*² says: “Indians have the advantage in point of time; and I feel satisfied that the Greeks borrowed much of their philosophy from the East”. *Weber*³ remarks that “there is no ground whatever to suppose that *Suśruta* borrowed his system of medicine from the Greeks, on the contrary there is much to tell against such an idea”.

¹ Transactions of the Royal Asiatic Society, vol. I.

² *Bhilsa Topes*, pp. 32-33.

³ *History of Indian Literature*,

Prof. Diaz of the Konnigsberg University, detects the principles of Indian medicine in the medical literature of the Greeks". "It is to the Hindus" says Wise, "we owe the first system of medicine." Royle has proved beyond doubt the indebtedness of the Greeks and Arabs to the Hindus. Haas's theory that *Suśruta* is the Indian adaptation of the Arabic name of *Suqrat* or *Buqrat*, the Arabic corruption of the Greek *Hippocrates*, and that *Kāsi* is an adaptation of the Island of *Cos* has been deservedly condemned as "an elaborate joke". Neuberger says:¹— "The similarity between Indian and Greek medicine of the period is in its outline and in certain details so striking that it is hardly surprising that the originality of the former has frequently been questioned or even denied. The more so is this true since the dates of the more important Indian works are fixed with the greatest difficulty, and before the discovery of the most recent manuscripts they were quite indefinite.

In consideration of the outstanding independent achievements of the Indians in most branches of science and art, and of their aversion from foreign influences, the trend of opinion to-day, informed by recent discoveries is in favour of the originality of Indian medicine in its most salient features."

Another fact must here be pointed out that the Hindus always acknowledged any help they might have received from other nations for the development of their science. The striking proof of this is found with reference to the science of astronomy—the only branch of learning which seems to have been influenced by the Greeks. *Varāhamihira* compiled his famous *Pañca-sidhāntica* or the collection of the five old treatises on astronomy,

¹ Neuberger. History of medicine, Vol. I, p. 45.

viz., Paulisa, Romaka, Vasiṣṭha, Saura, and Paitamoha. Both Weber and Kern have no doubt that Paulisa was a Greek and the name Romaka speaks for itself. But in the Hindu medical literature there is no mention of any foreign help, and the Indian medical treatises do not contain a single technical term which points to a foreign origin. It is interesting to quote the well known passage of Garga: "The Yavanas (Greeks) are Mlecchas, but amongst them the science (astrology) is well established. Therefore they are honoured as R̥sis—how much more than an astrologer who is a Brāhmaṇ". It is a standing monument of the catholic spirit of the Hindus, and they know no better way to show their respect for the learned men of the world. To this may well be contrasted the behaviour of the Greeks towards the other nations. The doctrines of Pythagoras are pre-eminently Indian¹, but that philosopher has not a word to speak of the Hindus. In astronomy the Greeks are indebted to Babylon: Ptolemy mentions that Hipparchus worked out and improved upon the astronomical computations of the Babylonians with reference to the moon; but recent discoveries from the clay tablets have shown that the figures ascribed to Hipparchus are merely copied from the numerical values worked out in Babylon. "The discovery of the precession of the equinoxes is generally ascribed to Hipparchus. It was he indeed, who brought this fact to the Greeks, and he estimated its yearly amount as from 36 to 39 seconds, but it is certain that he learned about it in Chaldea, and that he obtained the elements of his calculations from the astronomical observations made on the lower Euphrates".² Paulus Aegineta

¹ See Enfield's History of Philosophy.

² Historian's History of the World. Vol. I, p. 596.

gives us a complete system of operative surgery of the ancients. Celsus, in the last two books of his work, has treated of the surgical operations with considerable accuracy; and though the former availed himself of the labours of the latter, Celsus is never mentioned as one of the sources of informations used by Paulus who appears to have been wholly unacquainted with his works; and Adams remarks "but when did a Greek writer ever acknowledge himself under obligation to a Roman"?

But are we to suppose that the Greeks wilfully concealed the names of the Indian physicians in their books? Surely not. The Greeks might not have known the real source of the informations which they probably received second-hand. There is historical evidence of an intercommunication between Greece and Persia from the time of Ktesias or the 4th century B. C. to the 6th century A. D. We also know of a tradition that the services of the Great Hippocrates—a kinsman of Ktesias, were required in the Persian court, but he declined the invitation. Again we know that books on ancient sciences of India were possibly made use of by the Persians in early times, and to this intercommunication may be due "the coincidences which have been observed between the science of the Greeks and that of the Hindus" (Royle).

As regards the indebtedness of the Persians to Sanskrit literature, "we have positive testimony on the subject, as the Baron de Sacy, in his account of the well-known Sanskrit origin of the Fables of Pilpay, states that these were first translated in Pehlevi during the reign of the Persian king Nooshirwan, who ascended the throne in 531, and died in 579 and who is reported by historians to have encouraged learning, and to have induced Grecian philosophy at his court. The translations

were made by the physician Barzouyeh who had brought the original from India with other books, and who by more than one previous journey to that country, had acquired a knowledge of Sanskrit. He is stated particularly, to have made two journeys, one for the purpose of procuring medicaments and herbs, and the other for obtaining specimens of literature of the Hindus"¹. "Previous even to this (A. D. 330), we hear of the Persian king Bahram visiting, in disguise, the court of Basdeo, sovereign of Canouge, to study the laws, religion and manners of the Hindus."²

But whatever differences of opinion there may be as regards the relation of the Greeks to the Hindoos, there is no doubt that the medical science of the Arabs was materially influenced by Hindu medicine. For we know that the medical treatises of Caraka, Suśruta and Mādhava were translated into Arabic in the beginning of the 8th century A. D., and the names of Scarac, Scirac or Xarac and Sarad occur in the Latin translations of Avicenna, Rhases, and Serapion.³ Rāy dwells at length on the similarity of description of leeches as written by Suśruta and Rhazes. The modern medical science of the West is principally based on the Grecian system as preserved in the books of the Arabian authors and so indirectly depends for some particulars at least upon the Indian system.

Sachau in his preface to Alberuni's India⁴ remarks as

¹ Antiquity of Hindu Medicine, p. 168-69.

² Ibid, p. 73.

³ Rhazes: 'De Emblico,' (Scarac Indianus), 'De Zinzibere, (Sarac)
 •Serapion: 'De Myrobalanis' (Xarch Indus), 'De Emblicis et
 bellericis (Xarcha Indus); Avicenna: 'Sub Emblico' (Scirac Indum).

⁴ Alberuni's India, Preface, p. xxx-xxxi.

follows:—"What India has contributed reached Bagdad by two different roads. Part has come directly in translations from the Sanskrit, part has travelled through Iran, having originally been translated from Sanskrit (Pali? Prakrit?) into Persian, and further from Persian into Arabic. In this way, *e.g.* the fables of Kalila and Dimna have been communicated to the Arabs, and a book on medicine probably the famous Caraka. *cf.* Fihrist p. 303". The Arabs also translated "Indian works on snakes (*sarpavidyā*), on poison (*viṣavidyā*).....on the veterinary art¹.....But not only were the medical books translated into Arabic we have evidence that Indian doctors practised in foreign courts. Sachau continues:² "Another influx of Hindu learning took place under Harun (A. D. 786-808). The ministereal family Barmak, then at the zenith of their power, had come with the ruling dynasty from Balkh, where an ancestor of theirs had been an official in the Buddhistic temple Naubehar, *i. e.*, *nava vihāra*—the new temple (or monastery). The name Barmak is said to be of Indian descent, meaning *paramaka*, *i. e.*, the superior (abbot of the *vihāra*?) *cf.* Kern, *Geschichte des Buddhismus in Indien*, ii. 445, 543. Of course, the Barmak family had been converted, but their contemporaries never thought much of their profession of Islam, nor regarded it as genuine. Induced probably by family traditions, they sent scholars to India, there to study medicine and pharmacology. Besides, they engaged Hindu scholars to come to Bagdad, made them the chief physicians of their hospitals, and ordered them to translate from Sanskrit

¹ Alberuni's India, Preface, p. xxxiv.

² Ibid p. xxxii.

into Arabic, books on medicine, pharmacology, toxicology, philosophy, astrology, and other subjects. Still in later centuries, muslim scholars travelled for the same purpose as the emissaries of the Barmak, *e. g.*, Almuwaffak, not long before Alberuni's time (Codex Vindobonensis, sive medici Abu Mansur liber, fundamentorum pharmacologiæ, Ed. Selignann, Vienna, 1859, pp. 6, 10, and 15, 9)."

"Harun-al-Rashid (786-809) had two Indians Manka and Saleh, as physicians at his court"¹ Manka translated the classical work on medicine, Susruta (*cf.* Steinschneider, Wissenschaftliche Blätter, Vol. 1, p. 79) and a treatise on poison, ascribed to Kānakya, from Sanskrit into Persian (see Prof. Flügel, in Zeitschrift der D. M. G. xi. 148 and's. 325). A Hebrew treatise on poison, ascribed to the Indian Zanik (Kanakya) is mentioned by Steinschneider Wissenschaftliche Blätter, Vol. 1, p. 65). Alberuni mentions an Indian Kankab as astrologer of Harun-al-Rashid (Reinaud, memoire sur l'Inde, p. 315). He is likewise mentioned as a physician. Another Indian physician of Harun-al-Rashid is called Mankba (Reinaud). In the year 1381, a work on veterinary medicine ascribed to Salotar was translated from Sanskrit by the order of Firroz Shaha after the capture of Nagorecote. A copy of it was preserved in the Royal Library of Lucknow². Among the Hindu physicians of the time one ابن دهن is mentioned *i.e.*, the son of DHN, director of the hospital of the Barmaks in Bagdad. This may be Dhanya, or Dhanian chosen probably on account of its etymological relationship with the name Dhanvantari the name

¹ Prof. Dietz, quoted by Royle, p. 64.

² Maxmüller's Science of Language, Vol. I, p. 166.

of the mythical physician of the gods in Manu's law book and the epics (*cf.* A Weber, *Indische Lithuraturgeschichte*, pp. 284, 287). A similar relation seems to exist between the names Kanka, that of a physician of the same period, and Kankayana, an authority on Indian medicine (Weber l. c., pp. 287, note, and 284 note, 302). The name *اثر*, that of an author of a book on drinkables, may be identified with Atri, mentioned as a medical author by Weber, l. c. p. 288."¹

For informations on the Arabic translations of Sanskrit works, see *Analecta Medica* by Dietz; Wustendel's *Geschichte der Arab Aerzte*; Cureton, "A collection of such passages relative to India as may occur in Arabic writers"; Wilson's note to the above in *J. R. A. S.* old series, vi, pp. 105-115. Puschmann, p. 162; and Bedroë, book iv. ch. 11. pp 286-299.

The Arabians added many durgs to the metieria medica of the Greeks and amongst them we find the following Indian drugs described:—

Diindar or Pinus Deodara.....	Devadāru ²
Artemesia Indica.....	Nāgdamani.
Piper cubeba.....	Sugandha marica.
Cassia fistula.....	Suvarnakha.
Senna or Cassia obrata.....	Sonāmukhī.
Galangal or Alpina galangal, Roxb.....	Kulin-jana.
Ammomum grana paradisi.	
Macis.....	Mace.
Nux moschata.....	Nutmeg.

¹ Sachau. *Ibid* p. xxxii.

² It is described by Avicenna under its Sanskrit name, where he says that deiudar. "est ex genera abhel juniperus, que dicitur pinus Inda; et syr aiudar est ejus lac" (Quoted by Royle).

- Bdellium.....Guggula.
 Tamarindus Indica.....Tintiḍī.
 Trifolia.....Triphala.¹
 Myrobalani.....Haritaki.
 Turpeth or Convolvulus Turpethum.....Trivit.
 Sel or Aegle marmelos.....Vilva.
 Santalum rubrum.....Candana.
 Melia azadirachta.....Nimba.
 Tembul (Piper betel).....Tāmbūl.
 Faufil (Arecha catechu).....Khadira.*
 Nux vomica.....Viṣamuṣṭi.
 Musa paradisiaca or plantain.....Kadalī.
 Moschos moschifera (from Thibet & India)Mṛganābhi.
 Dolichos lebleb.
 Orange or Citrus aurantium.....Nāgarauṅga.
 Limon or citrus medica.....Mātulurūga.
 Pearls and other precious stones such as lapis lazuli, Borax, &
 Rhubarburnum or Indian Rhubarb, etc.

We can trace the Arabic and Greek names of some of the medicaments to a Sanskrit source. Royle has discussed them at length, so we need give here only a synopsis of it:—

Triphalā (S)—Tryphalla (A)—Tryphalla (G)—Tryphala parva (modern).

Devadāru (S)—Deiudar (Avicenna)—Deedara ((i)—Pinus deodaru.

Tvaka-kshira (S)—Tabosheer (A).

Tamālpatra (S)—Malatroon or Malabathrum (G).

Tejapatra(s), or tuj—Sadej (A).

¹ Actuarius copies from Serapion and Mesue, the use of this medicine. The very name is Sanskrit, meaning the 3 myrobalans. Serapion refers to Xarch indus or Charak, in his De Myrobalani (Royle, P. 37).

Tāmbula (S)—Tumbol (P)—Tūmbol (A).

Pippali (S)—Pippul (H)—pilpil (P)—filfil (A)—(G)—
piper (E).

Srīṅgavera (S)—Shimgveez (P)—Zinzabil (A)—Zingiber (E).

Aguru (S)—aggur (H)—Agila (M)—Pao-d'aglia (aquilia)
(po)—Aod Hindee Agallochum (G).

Candana (S)—chundan (H)—Shandana (T)—Sundul (P)—
Santal (E).

Kolinjana (S)—Galanga (G).

Vaca (S)—Wuz (A).

Dāvrusita (S)—Darcheeni (H)—Darsheeni (A).

Cacyn-nama (C)—Akimona (P)—Kaimanis (M)—Cinnamon.

Kuṣṭha (S)—Kooth (H)—Kust (A)—Koosrus (G)—
Koshta (Sy).

Abnus—Ebony (E).

Kubara (S)—pupal (P)—fufal (A).

Sajikā (S)—Sajiimattee, sajiloon, sajii (H)—Sajimen vitri
(Geber)—Soza or soda (E).

Khar, khari (S)—Kali. (A).

Kussas, missy (India)—misy (A)—misy (G).

Tincana (borax)—Tinkar (P)—tincal (E).

Ambara (S)—Kharoba (A)—Amber, Ambegrise (E).

Kassis (tin)—Kassiteros (G).

Tuttha (S)—tootum or tutia (H)—tutia (P)—tatanagum
(T)—tutenagun and tutty.

Manasīlā (S)—Mansil (G).

Haritāl (S)—hartal.

Sarkarā (S)—sakkara (T)—sukkur (A)—Sugar (E).

Sandarachā (S) or sulphuret of arsenic—Zarnach (P & G).

Sphotaka (S)—phoska (B)—pōeta (A. S.)—pocke (Ger).

Tintidi (S)—Tamar Hind (A)—Tamarin (Fr)—Tamarind
(Italy & Sp)—Tamarind (B)—Tamarindus India (L).

Masurikā (S)—Masern (Ger)—Measles (E).

Vraṇa (S)—verole (Fr)—variola (L).

Danga (Hindus)—Dandy—Dengue (Sp).

S—Sanskrit. A—Arabic. G—Greek. T—Tamil. P—
Persian. M—Malayan. Po—Portuguese. Sy—Syriac. Ger
—German. A. S.—Anglo-Saxon. H—Hindi. E—English.
B—Bengali. F—French. L—Latin. It—Italy. Sp—Spanish.

Not only is the influence of the Sanskrit medical works detected in the Persian, Hebrew, Arabic, Greek and Roman works on medicine, there is evidence that the Hindu system of medicine was also adopted by the Tibetans and the Chinese. In the January No. 37 of the J.A.S.B. 1835 Vol. IV, an analysis of a Tibetan work is given by Alexander Csoma de Koros. It is called "rgyud bzhi" (the tract in 4 parts). It is attributed to Sakhya. "In the time of Khrisrong Dehutsan (i.e. 8th or 9th century of the Christian era) a Tibetan interpreter Bairotsana (or Vairochana) having translated in Cashmere, with the assistance of physician-pandit (Davam Non-gah) presented it to the above mentioned Thibetan king." In a Note on Thibetan surgical instruments, Walsh says:¹ "The present practice of surgery in Tibet is very simple, and, as already noted, consists chiefly of cupping, cauterizing, and bleeding. The Am-chhi informed me that the only instruments used are the cupping-bow (མེ་བུ་ me-puñ, or མེ་བུ་ me-bum, both meaning 'fire vessel'), in which

¹ The Thibetan Anatomical System by E. H. C. Walsh in J. R. A. S. 1910, pp. 1244-45.

paper is lit and the bowl is placed while hot over the part to be blistered; the sucking-horn (འཇིབ་རུ་ *ʼjib-ru*), by which cupping by vacuum is done; the canterly (ལྷག་སེ་ *lchags-me*), the lancet (རྩ་ཁུ་ *rtsa-u*), for bleeding, and a golden lancet (གསེར་ཀྲི་རྩ་ཁུ་ *gser kyi rtsa-u*) for operating on the eye.

In the journal of the Buddhist Text Society of Calcutta for 1894 three Tibetan block prints are illustrated, which contain representations of a large number of surgical instruments, some of them of an elaborate nature, including specula, saws, catheters, exploring needles, instruments for tapping hydrocele, and mid-wifery and other forceps. The block-prints were brought by Rai Saratchandra Das, Bahadur, from Lhasa,¹ and a description of the figures was given by the late Lama Śes-rab MGya Mtsho, the Abbot of Ghoom Monastery, near Darjeeling, who was formerly physician to the late Tashi Lama, which were explained in a paper read by Dr. Saradaprasad Banerjee.²

If the elaborate and various instruments shown in the block-print were ever in general use they appear to have now ceased to be used."

In the J.R.A.S. April 1907, is mentioned "a Chinese text corresponding to a part of the Bower manuscript" by Watanbe. The identified portion of the MSS. consists of the six leaves which appear in plates XLIX-LIV (Hoernle's ed). The corresponding Chinese text is contained in six translations of which the following three, correspond completely to the MSS.

¹ Journal of the Buddhist Text Society, Vol. II, Pt. III, Calcutta 1894, P. III.

² Ibid, pp. IX. X.

1. Mohamayuri vidya-rajui—translated by I'tsing 705 A.D.
2. " " " " Amoghavajra 746
to 771 A.D.
3. " " " " Sanghapala 516
A.D.

Again many articles are common to the Hindus and Chinese materia medica; as many aromatics (nutmeg, cloves, cinnamon and pepper), musk, rhubarb etc. And this is not at all surprising for we have evidence "that there was constant intercourse¹ between these countries even before the Christian era, by means of travellers and ambassadors; and that Buddhist priests in visiting China, took with them as presents classical Indian books. It is also worthy of note, in connexion with the chapter on this subject in Suśruta, that in A.D. 648, the Emperor of China having sent an ambassador to India, this officer met with a doctor, who told him that he was 200 years old, and that he possessed the recipe of immortality, upon hearing which, a second embassy was despatched in search of the philosophical stone" (Royle).

Even the modern medical science of Europe has been directly influenced by the Hindu system of medicine. In the materia medica used by the doctors in Europe now, we find the following curative agents—the produce of India. I quote here the list as prepared by Thakore Shaheb² :—

"Aconitum heterophyllum	...	Ativisha.
Allium cepa	...	Polandu.
Acacia catechu	....	Khadira.

¹ See Asiatic Journal, July 1836.

² History of Aryan Medical Science, P. 128.

<i>Alhagi maurorum</i>	...	Yavasa.
<i>Alstonia scholaris</i>...	...	Saptaparna.
<i>Ammomum elettarum</i>	...	Ela.
<i>Andropogon nardus</i>	...	Ushira.
<i>Andropogon schænanthus</i>	...	Katurina.
<i>Artemisia sternutatoria</i>	...	Agnidamani.
<i>Berberis lycium</i> ...	...	Daruharidra.
<i>Butea frondosa</i> ...	...	Palasha.
<i>Cassia lanceolata</i> ...	...	Sonamukhi.
<i>Cucumis colocynthis</i>	...	Indravaruni.
<i>Dhatura alba, niger &c.</i>	...	Dhattura.
<i>Justicia adhatoda</i>...	...	Atarusha.
<i>Luffa amara</i> ...	...	Katukoshtaki.
<i>Linum usitatissimum</i>	...	Atasi.
<i>Mallotus Philippiensis</i>	...	Kapillaka.
<i>Myrica sapida</i> ...	...	Katfala.
<i>Ophelia chiretta</i> and <i>Ophelia</i> <i>augustifolia</i> ...	...	Kirata.
<i>Pimpinella Anisum</i>	...	Shatapushpa.
<i>Pongamia glabra</i>...	...	Karanja.
<i>Ptychotis ajowan</i> ...	...	Ajamoda.
<i>Ricinus communis</i>	...	Eranda.
<i>Salvinia cucullata</i>	...	Undurkarnika.
<i>Santalum album</i> & <i>Santalum</i> <i>flavum</i> ...	...	Chandana.
<i>Shorea Robusta</i> ...	...	Ajakarna.
<i>Strychnos potatorum</i> , <i>Strychnos</i> <i>nux vomica</i> ...	...	Katakafala.
<i>Tinospora Cordifolia</i>	...	Guḍuci.

Valeriana Hardwicki	... Tagara.
Wrightia Antidysenterica	... Indrayava."

To this list may be added the following; drugs from the Indian and Colonial Addendum to the British Pharmacopœa, 1898 :—

Acacia Arabica	... Vāvula.
Acalypha Indica	... Muktabarṣi.
Andrographis Paniculata	... Kirāta.
Aristolochia Indica	... Arkamula.
Arachia Hypogaea	... Bucanaka.
Citrus Aurantium	... Nāgarāṅga.
Azadirachta Indica	... Nimba.
Aegle Marmelos	... Vilva.
Piperbetel	... Tāmbula.
Butæa Gummi.	
Cæsalpina Sappan...	... Patanga or Bakam.
Calotropis Procera and C. Gigantiæ	... Arka.
Gossypium Herbaceum	... Kārpāsa.
Cambogia Indica.	
Cissampelos Pariera	... Ambashthai.
Coscinum Fenestratum	... Dāru-haridrā or darvi.
Gynocardia Odorata	... Chālmugra.
Hygrophila Spinosa	... Kokilākṣa.
Anogeissus Latifolia	
Embelia Ribes and E. Robusta...	... Viḍaṅga.
Plantago Ovata	... Ispaghula.
Ipomæa Hederacea	... Kālādāna.
Ipomæa Turpethum	... Trivit.

Mylabris Phalerta.

Terminalia Chebula ... Haritaki.

Sesamum Indicum ... Tila.

Picrorhiza Kurroa ... Katuka.

Urginea Indica ... Vanapalandu.

As regards the medicines used by the Hindus, Neuberger says¹:

"The Pharmacopia, corresponding with the fruitful nature of the land was a rich one and stamps Indian medicine with a character entirely its own, whilst nothing speaks more eloquently for its originality than the fact that of all the many medicinal plants no single one was European."

Elphinstone wonders at the knowledge of simples in which the Hindus early gave lessons to Europe and "more recently taught us the benefit of smoking *Datura* in asthma and the use of cowitch against worms," and "the prescribing of *Nux Vomica* in paralysis and dyspepsia, and the revival of the use of *Croton Tiglium*" (Royle). In surgery, too, the modern surgeons of Europe have borrowed the Indian method of Rhinoplastic operation first made known to European surgeons by a letter which was printed in the Gentleman's Magazine for October 1794, p. 891. In fact Dr. Hirschberg of Berlin says that "the whole plastic surgery in Europe had taken its new flight when these cunning devices of Indian workmen became known to us. The transplanting of sensible skin flaps is also an entirely Indian method." The modern method of making pockets for the

¹ Neuberger, History of Medicine, vol. I. P. 54.

testicles under the Colles' fascia after the operation for scrotal tumour (elephantiasis) can be traced back to the age of Suśruta¹.

Thus we see that it can safely be affirmed that the medical science of Europe has been, both directly and indirectly, influenced by the Hindu System of Medicine.

¹ पादौ निरस्तमुष्णस्य जलिनं प्रोत्थ्य चाक्षिणी ।

प्रवेश्य तुल्यसेवया मुष्णौ सीव्येत्ततः परं ॥

Suśruta Saṁhitā, IV. ii.

APPENDIX.

I'Tsing¹ says :—

“The following are the eight sections of medical science. The first treats of all kinds of sores; the second, of acupuncture for any disease above the neck; the third, of the diseases of the body; the fourth, of demoniac disease; the fifth, of the Agada medicine (i.e. antidote); the sixth, of the diseases of children; the seventh, of the means of lengthening one's life; the eighth, of the methods of invigorating the legs and body. ‘Sores’ (1) are of two kinds, inward and outward. The disease above the neck (2) is all that is on the head *and face*; any disease lower down from the throat is called a ‘bodily’ disease (3). The ‘Demoniac’ (4) is the attack of evil spirits, and the ‘Agada’ (5, but 6 of Âyur-veda) is the medicine for counteracting poisons. By ‘Children’ (6, but 5 of Âyur-veda) is meant from the embryo stage until after a boy's sixteenth year; ‘lengthening life’ (7) is to maintain the body so as to live long, while ‘invigorating the legs *and body*’ (8) means to keep the body and limbs strong and healthy. These eight arts formerly existed in eight books, but lately a man epitomized them and made them into one bundle. All physicians in the five parts of India practise according to *this book*, and any physician who is well versed in it never fails to live by the official pay. Therefore Indians greatly honour physicians and much esteem merchants, or if they do not injure life, and they give relief to others as well as benefit themselves. I made a successful study in medical

¹ A Record of Buddhist Practices, Ch. XXVII, pp. 127-8.

science, but as it is not my proper vocation I have finally give it up."

Dr. Takakusu¹ comments on the passage as follows :—

"The eight sections of Medicine which I-tsing describes are no doubt the eight divisions of the Âyur-veda. He mentions an epitomiser of these divisions, who seems to have been a famous physician and contemporary of I-tsing (or just before I-tsing). This epitomiser may be Susruta, who calls himself a disciple of Dhanvantari, one of the Nine Gems in the Court of Vikramāditya

Prof. Wilson says in his Works, vol. iii, p. 274 :—

"The Âyur-veda, which originally consisted of one hundred sections, of a thousand stanzas each, was adapted to the limited faculties and life of man, by its distribution into eight subdivisions, the enumeration of which conveys to us an accurate idea of the subject of the Ars Medendi amongst the Hindus.

The eight divisions are as follows :—

I. Sâlyâ (I-tsing's (1) cure of sores).

The art of extracting extraneous substances, grass, earth, bone, &c., accidentally introduced into the human body, and by analogy, the cure of all phlegmonoid tumours and abscesses. Sâlyâ means a dart or arrow.

II. Sâlâkyâ (I-tsing's (2) art of acupuncture).

The treatment of external organic affections or diseases of the eyes, ears, nose, &c. It is derived from Sâlâkâ, "a thin and sharp instrument," and is borrowed from the generic name of the slender probes and needles used in operation on the parts affected.

¹ A Record of Buddhist Practices, Ch. XXVII, pp. 222-3.

The above two divisions constitute the surgery of modern schools.

III. *Kāya-kikitsā* (I-tsing's (3) treatment of the diseases of the body).

The application of the *Ars Medendi* (*Kikitsā*) to the body in General (*Kāya*). It forms what we mean by the science of medicine.

IV. *Bhūta-vidyā* (I-tsing's (4) treatment of demoniac disease).

The restoration of the faculties from a disorganised state induced by demoniacal possession. The art vanished before the diffusion of knowledge, but it formed a very important branch of medical practice through all the schools, Greek, Arabic, or European.

V. *Kaumāra-bhṛitya* (I-tsing's (6) treatment of the diseases of children).

The care of infancy, comprehending not only the management of children from their birth, but the treatment of irregular lactic secretion, and puerperal disorders in mothers and nurses.

VI. *Agada* (I-tsing's (5) *Agada* medicine).

The administration of antidotes—a subject which, as far as it rests upon scientific principles, is blended with our medicine and surgery.

VII. *Rāsāyana* (I-tsing's (7) application of the means of lengthening one's life).

Chemistry, or more correctly alchemy as the chief end of the chemical combinations it describes, and which are mostly

metallurgic, is the discovery of the universal medicine—the elixir that, was to render health permanent, and life perpetual.

VIII. *Vāḡikarāṇa* (I-tsing's (8) methods of invigorating the legs and body).

Promotion of the increase of the human race—an illusory research, which, as well as the preceding, is not without its parallel in ancient and modern times.'

Prof. Wilson further remarks :—'We have, therefore, included in these branches all the real and fanciful pursuits of physicians of every time and place. *Susruta*, however, confines his own work to the classes *Sālya* and *Sālākya* or surgery; although, by an arrangement not uncommon with our own writers, he introduces occasionally the treatment of general diseases and the management of women and children when discussing those topics to which they bear relation.' (See *Wilson's Works*, vol. iii, p. 276.)'

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